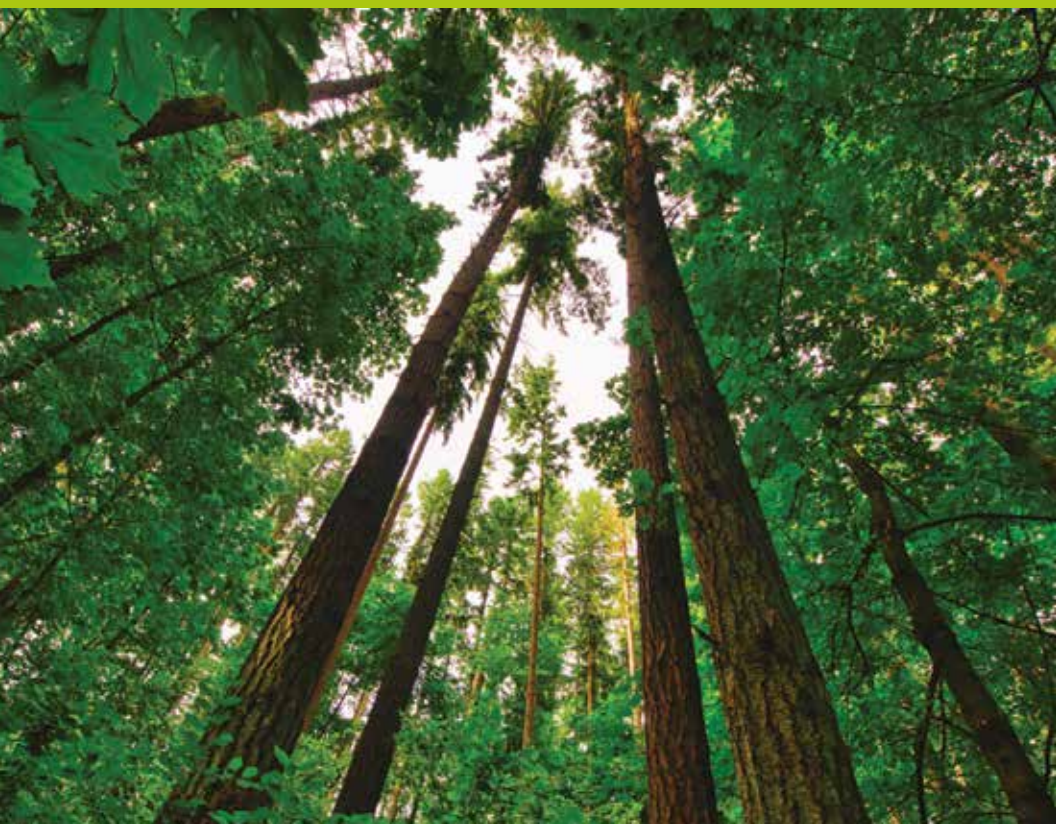
Forestry for the Birds
Western Oregon

A guide to enhancing forest habitat for birds and humans



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The **Forest Stewards Guild** is a national non-profit organization whose mission is to support sustainable forestry and forest communities through science and outreach. For more about the Forest Stewards Guild: www.foreststewardsguild.org.

Acknowledgments

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Section I

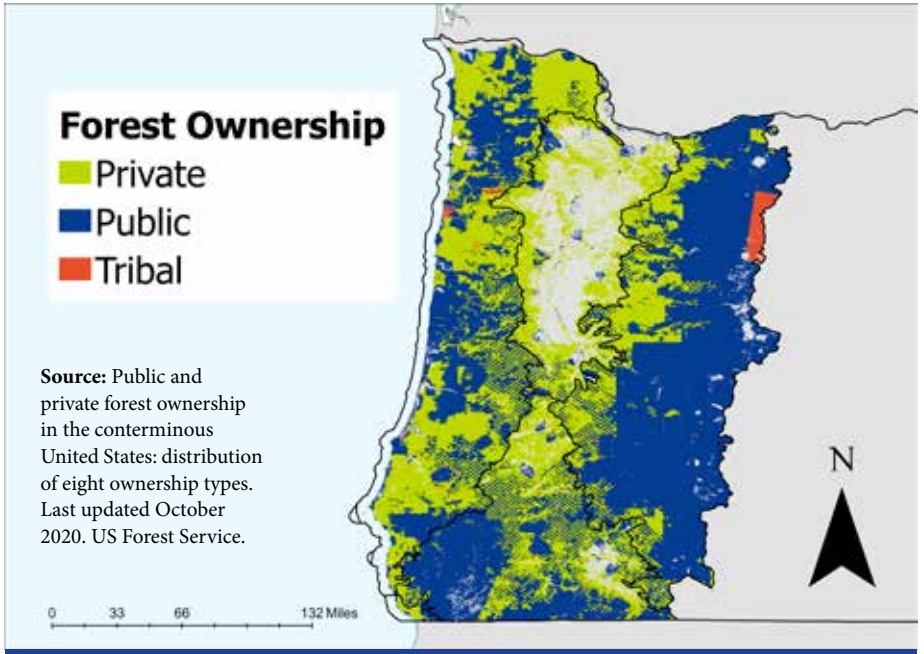
Introduction to Forestry for the Birds

Who is this Guide For?

This Guide will support foresters, landowners, and loggers working or walking in the woods and considering bird-habitat spaces. You can use the Guide like a menu to help enhance your management plans with birds in mind. *Forestry for the Birds* can also help you see how birds use your land today and through a natural cycle of disturbance and renewal.

What is Forestry for the Birds?

Forestry for the Birds: Western Oregon is an educational program that supports bird populations and forest function through bird-friendly forest management and planning. The program highlights the forest's role for bird species and how to enhance habitat for their benefit through partnerships among land managers, landowners, and other forest stewards. Built on a framework established in the northeastern United States, *Forestry for the Birds* collects and synthesizes the best available science on sustainable forest management and avian ecology to provide strategies for creating bird habitat in contemporary forests. The occurrence, abundance, and behaviors of habitat-specific bird species give us a "bird's-eye view" of how a forest functions at a local and landscape level. *Forestry for the Birds* aligns human needs (e.g., economic return, enjoyment of forests, fire resilience) with bird needs (e.g., habitat availability, diversity of forest structure and composition) through forestry.



Western Oregon Forest Ownership

Forests are integral to the culture, economy, and ecology of northwestern landscapes. Though 65% of the western Oregon forests are publicly held, private forests play a critical role in conservation. Private forests connect agriculture and urban settings, buffer public forests, parks, and roadways, protect watersheds, cool rivers, cycle nutrients, and store carbon. Well-managed private forests connect habitats at small and large scales, provide habitat diversity, and supply timber products to society. They support birds, pollinators, elk, gophers, fungi, bears, lichen, fishers, and frogs, and they support human families and communities. *Forestry for the Birds* helps people get the most from their land while supporting these essential forest values. *Forestry for the Birds* is a resource that informs forest management efforts, enhancing current and future bird habitat while meeting other property objectives.

Forestry for the Birds:
• Is designed to encourage bird-friendly forestry practices across the landscape.
• Connects forest stewards of all kinds, including landowners and their families, loggers, foresters, academics, nonprofits, and public agencies.
• Is voluntary, free to use, and can be tailored to fit individual forest ownership needs.
• Celebrates any level of participation, from learning to identify a few local bird species to implementing large-scale forest stand improvement.
• Can integrate harmoniously with long-term forest management plans and bird population inventories.
• Shows that actions large and small can amount to meaningful gains for birds in the region.

Bureau of Land Management, 2014

Why Do We Need Forestry for the Birds?

Bird populations across North America and in the Pacific Northwest are in sharp decline—there are 3 billion fewer birds now than in 1970—due largely to habitat loss. Cities and suburbs, domestic cats, and pesticides also impact bird safe harbors and species diversity. However, with intentional forest management, we have an opportunity to help. Small, stand-level management actions in non-industrial, family-owned woodlands can improve bird habitat and forest ecosystems as landowners participate across the landscape.

This Guide focuses on Western Oregon, understanding that what applies here applies more generally to most private forests west of the Cascade's crest and north of the Klamath Mountains. In time, the *Forestry for the Birds* approach can be applied to other forests in the Pacific Northwest and across the west.

Through watching birds, we see more of the habitat features that forests provide. *Forestry for the Birds* provides a way to track the life and growth of the forest, personalize the turning seasons, and make them more enjoyable to explore. Birds are a colorful way to mark the gradual changes that take place in complex forest environments. We learn to recognize that we can make working woodlands and small parcels better places for birds through small changes in management. This is ***seeing the forest for the birds.***

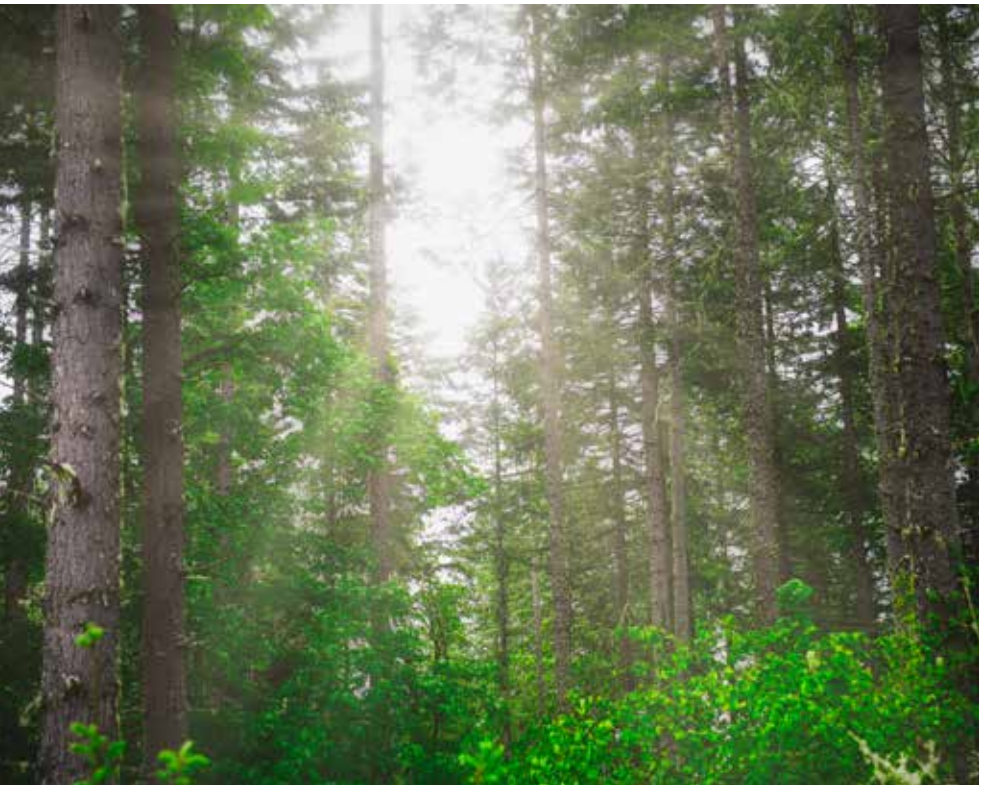
How to Use this Guide

With this Guide, you can:

- *Learn how birds use different forest features.* This Guide will help you develop bird identification skills and determine how to assess bird habitat, including after a timber harvest.

- *Identify techniques for enhancing bird habitat* (timing a harvest, retaining downed wood, remnant trees or large snags, etc.) as you meet your management objectives. In this case, landowners may want to find a forester who will help implement specific goals.

- *Supplement your forest stewardship goals* by increasing the value of your forest for wildlife in the context of the surrounding forest or landscape.



Tualatin Soil & Water Conservation District, 2019

Guide Content

Section II of this Guide introduces the following forest types and habitat associations as a bird would see them:

- Conifer-dominated forest habitats
- Riparian habitats
- Oak habitats

Section III introduces forest birds – how to identify them, where to find them, what they eat, and how they move across a landscape. Section III includes a suite of focal bird species whose habitat use collectively paint a picture of desirable forest habitat features in the region.

Section IV presents ideas for managing forests with birds in mind.

Whether you're getting to know your woodland or are an experienced birder, this Guide offers a well-rounded introduction to *Forestry for the Birds*.

This Guide is not:

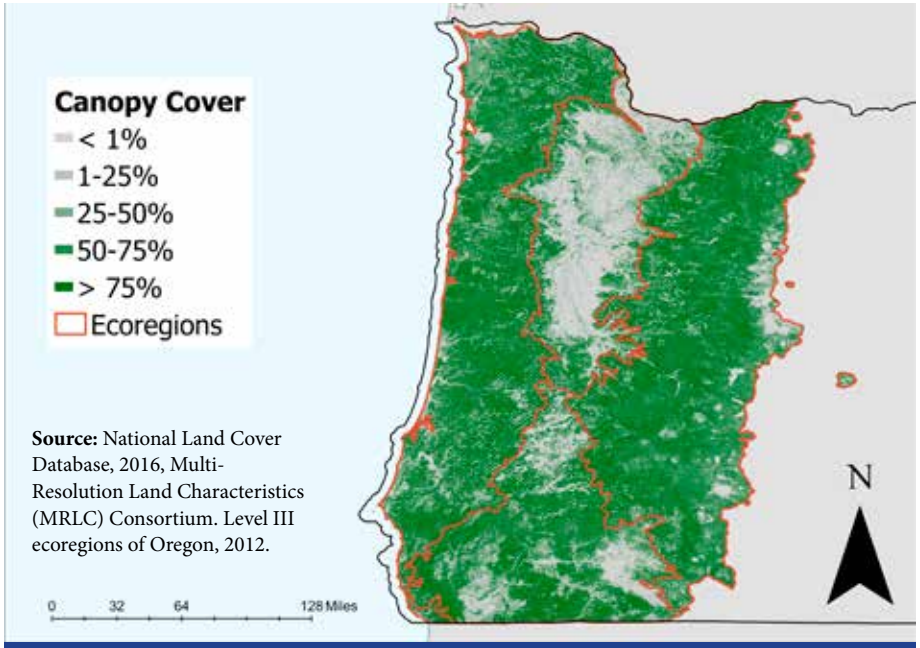
- A complete guide to birds of the region.
- A prescriptive, one size fits all, instruction manual. Every forest's journey is unique, and this Guide is a helpful resource for forest managers with various management goals.

Additional resources on identifying birds, finding a consulting forester, and exploring funding opportunities can be found on the Forestry for the Birds: Western Oregon web page at www.foreststewardsguild.org.

Section II

Forest Habitat Types and Structure

Forests can be described by characteristic species of trees, shrubs, and herbaceous plants, or physical features. Certain suites of birds "flock to" specific habitat types. For example, old and mature conifer forests are home to the Pileated Woodpecker, Varied Thrush, and Hermit Warbler, while oak habitats support White-breasted Nuthatches and Acorn Woodpeckers.



Western Oregon Canopy Cover

From a bird's eye view Western Oregon (map reference: Western Oregon Canopy Cover) provides an array of tree coverage providing shelter, food, and a diversity of tree species. Across the landscape tree species wax and wane creating a variety of forest types, yet it is the habitat these forests provide that birds value.

Forest Habitats

This Guide addresses three broad forest habitat associations: conifer, riparian, and oak.

Conifer forest habitats, most notably Douglas-fir, dominate the west side of the Cascades. Within conifer forest types, this Guide uses a bird habitat lens to focus on a gradient of forest types from the coast to the mountains: sitka spruce, Douglas-fir/western hemlock/western redcedar, Pacific silver fir, and mountain hemlock. Each of these forest types is the product of regional variation in elevation, moisture, and geology.

Riparian habitats are areas that include and are influenced by flowing water or bodies of water. These habitats support a wide variety of birds, an abundance of insects, shrubs, forbs, and characteristic broadleaf species such as black cottonwood (*Populus trichocarpa*), red alder (*Alnus rubra*), and Oregon ash (*Fraxinus latifolia*). More exceptionally, riparian forests weave from the Cascades to the Coast between all forest types.

Oak habitats range from the northern end of the Klamath Mountains up through the Umpqua, Rogue, and Willamette Valleys and continue into Western Washington. These habitats are growing rarer throughout the Northwest and are more commonly found on private land between agricultural valleys and conifer forests or overlapping riparian habitats.

Forest Structure

As forests grow, they undergo a succession of structural development: early-successional, mid-successional, and late-successional. From a bird's perspective, these successional stages are described in the table to the right.

Riparian habitats in the region are among the most dynamic portions of the landscape and adhere to their own successional stages. Because they are subject to high levels of disturbance, they may go through multiple successional pathways. For example, the areas closest to waterways have more small-diameter hardwood trees and greater herbaceous and shrub diversity.

Common oak habitat associations in the region may also grow through successional stages (though at a slower rate than their counterparts) and feature different structural characteristics.

This Guide focuses more on forest structure than age class delineations and describes "younger" versus "more mature" features of the habitat types.

Steven Sobieszczyk/USGS, 2015

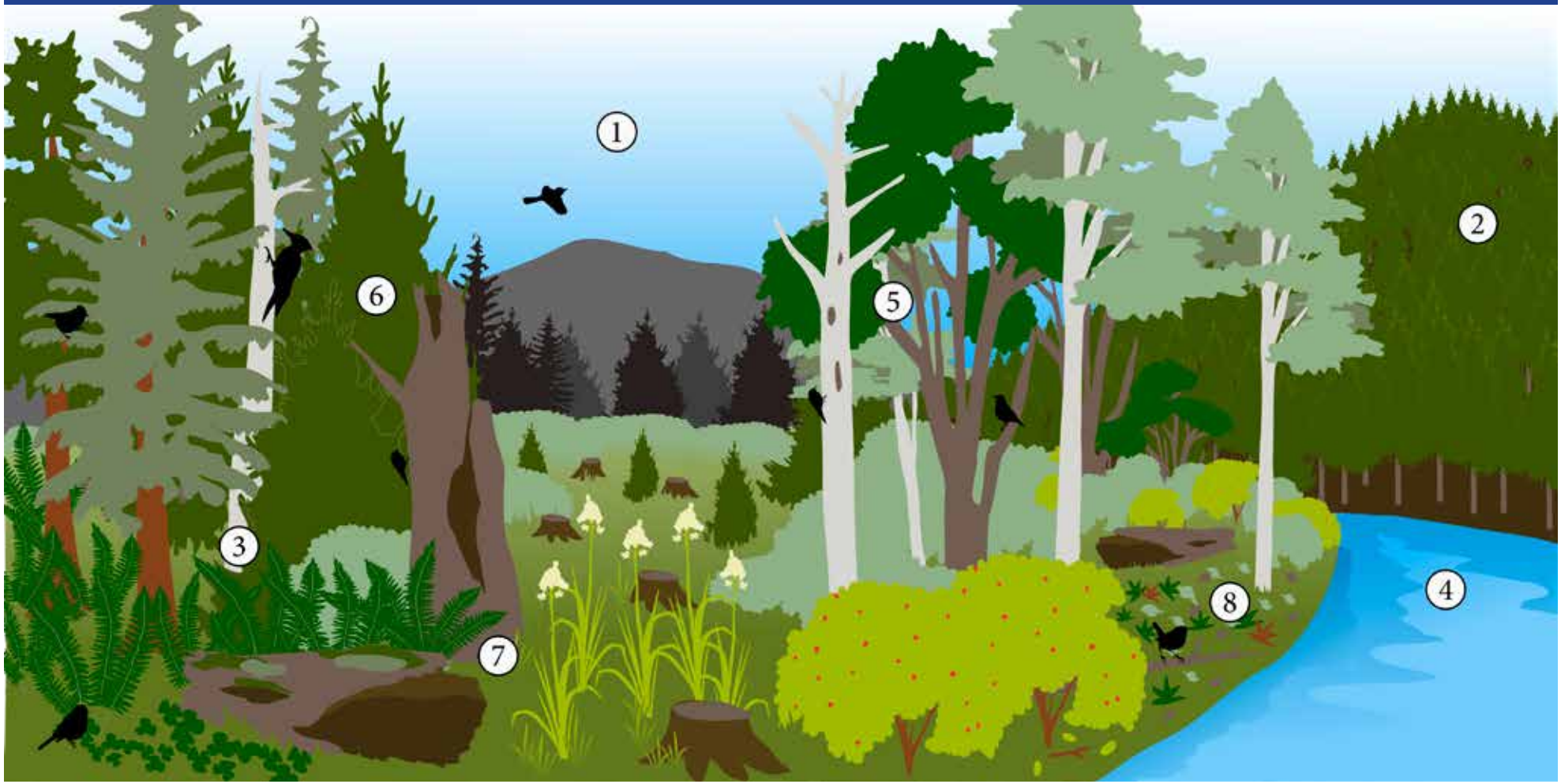
General Forest Succesional Stages and Structural Features

Successional Stage	Structural Features
Early-successional *seedling-sapling stage*	• Canopy open (70-100% open sky) • Dominated by grasses, forbs, shrubs, and even-aged cohort of tree seedlings
Mid-successional *young forest*	• Initially dense, closed canopy, becoming mixed-open canopy as trees grow • Smaller diameter trees • Competition leads to exclude smaller trees and understory plants • Understory begins transition to shade-tolerant trees and herbaceous plants
Late-successional *mature forests*	• Moderately developed sub-canopy and shrub layer • Greater age diversity • Larger diameter trees

Habitat Features

Finally, forests matter to birds across these habitat types and forest structures because of habitat features such as patch size, canopy or shrub layers, and habitat edges. The following graphic shows different habitats and their features across a landscape. Much like the graphic depicts, all these features can be relatively close within a single viewshed. If not visible from a single point in your forest, thinking about where these features are in proximity to your forest is a good exercise in developing a sense for the landscape.

Habitat Features



1. **Open Canopy:** Gaps in the forest with no trees create space for early successional plant species such as grasses and shrubs. Some birds require this habitat to forage, nest, and evade predators.
2. **Closed Canopy:** Established forests often have closed canopies, meaning the trees in the canopy do not allow sunlight to reach most of the forest floor. Some birds use this habitat for nesting.
3. **Understory:** The layer of vegetation beneath the forest canopy includes a variety of plants that can grow with varying levels of light available.
4. **Water:** Habitat along the margins of water bodies such as rivers, streams, and lakes often contain vegetation that prevents erosion and provides wildlife food and cover.
5. **Structural Features:** Variability in forest structure includes the differences in live-tree sizes and branch size, understory vegetation, foliage distribution, and variation in canopy density horizontally and vertically.
6. **Snags & Cavities:** Standing dead or dying trees provide a place to forage and nest for birds such as the Pileated Woodpecker, Brown Creeper, and other wildlife.
7. **Course Woody Material:** Fallen trees and limbs on the ground add structure to the forest floor and support insect prey for birds.
8. **Fine Woody Material & Leaf Litter:** Undecomposed organic material such as leaves, needles, and twigs on the forest floor provides nesting material and foraging habitat.

Canopy

Canopy features can indicate which tree species are dominating a stand, tree density, understory and light, and forest structure.

Canopy gaps are used as foraging habitat by many bird species and allow light within the understory. More light leads to more tree regeneration and development of understory vegetation.

Closed canopies exclude or limit understory vegetation. Depending on the maturity and species composition, it may lead to connectivity or provide open-air within mid-canopy gaps, allowing for flight and forage under the safety of the upper closed canopy.

Coarse Woody Material and Forest Floor Complexity

Downed coarse and fine woody material promotes soil health and biodiversity, creates substrate and forage for insects, and secures cover for birds that feed and nest on the ground.

Leaf litter, in riparian, oak, and mixed forest types (containing deciduous/ hardwood trees), provides nesting habitat and foraging substrate for many insectivorous birds. Ecologically, leaf litter functions much like downed woody debris and contributes to forest floor complexity, carbon storage, and soil moisture.

Snags and Cavity Trees

Snags (dead standing trees) and **decaying parts of live trees** provide essential foraging and nesting habitat. Large snags accommodate larger-bodied birds and last longer as a source of cavities, food, and coarse woody debris. How large is large? Depending on the forest type, bird species, and land-use history, largeness is relative. For example, natural "chimneys" (vertical hollows) used by Vaux's Swift are ideally situated in snags with a diameter at breast height of more than 27 inches and more than 82 feet tall.

Water Features

Riparian habitat features include **running water like creeks and rivers, seasonal water in ponds and creeks, or slow-moving springs and dammed waterways**. These features provide support to the hydrological function of a stand, promote herb, shrub, and deciduous plant communities such as red alder, that in turn capture nutrients, provide habitat, and support insect life.

Forest Habitat Associations

From the human perspective, conifer forest habitats are often emphasized for their economic importance, riparian habitats are protected for the role they play in water quality and quantity, and oak habitats are addressed for their historical importance as well as potential climate change resilience. Historically, forested valleys containing bottomland riparian woodlands, wetlands, and Oregon white oak habitats provide ideal conditions for urban and suburban development. Departing from the human perspective, this Guide looks across the landscape identifying these same habitats for the features that make them desirable for birds.

Conifer-dominated Habitats

Coniferous forests dominate the landscapes of the Pacific Northwest, with conifers making up more than 85% of the region's trees. Furthermore, conifer forests of western Oregon and Washington are among the most productive in the world, and the Douglas-fir forests that dominate the region support the highest bird densities of any coniferous forest system in North America. Douglas-fir (*Pseudotsuga menziesii*) are abundant, fast-growing trees and can be both an early

Forest Habitat Association	Forest Type
Conifer-dominated	Douglas-fir / western hemlock / western redcedar
	Sitka spruce
	Pacific silver fir
	Mountain hemlock
	Mixed Conifer
Riparian	
Oak	Oak woodland
	Oak conifer

colonizer of new habitats and a significant component of a centuries-old forest canopy. The growth potential of Douglas-fir forests and their accessibility have made them some of the most heavily managed forests in the world.

However, Douglas-fir are not the only tree species, let alone conifer species, in Western Oregon. Many of these conifers can dominate a forest and provide unique habitats, allowing for their own forest type classification. Some conifers, like mountain hemlock (*Tsuga mertensiana*) or Pacific silver fir (*Abies amabilis*) are found at higher elevations and growing in the colder temperatures of the Western Cascades. These forests and their associated understory species have developed alongside a diversity of bird species, providing necessary habitat. These higher elevation habitats also provide slope stability, clean water, and water storage.

Across the valley to the coastal range, where precipitation is high, western redcedar (*Thuja plicata*), western hemlock (*Tsuga heterophylla*), and Sitka spruce (*Picea sitchensis*) play a vital role in keeping steep slopes and soils stable. Along the coast, Sitka spruce provides important nesting habitat for large birds like Great Blue Heron and Bald Eagles, and forage for songbirds like the Red Crossbill and Stellar's Jay.

Tualatin Soil & Water Conservation District, 2019

Riparian Habitats

Over 40 bird species are associated with riparian habitats in Western Oregon. This habitat zone is found around flowing and sedentary bodies of water and functions as a buffer that assists with nutrient cycling and enhancing water quality. Riparian habitats are typically found intermingled with other forest types of Western Oregon and essentially come in two forms:

- **Headwater habitats** occur at higher elevations and typically consist of narrower stream beds and zones, with little to no floodplain.
- **Bottomland riparian forests** are common throughout valley lowlands, including the Willamette Valley, and often have multilevel shrub understory and wider riparian zones.

Deciduous trees dominate most riparian habitats. For example, bottomland riparian tree canopies are over 70% deciduous. These riparian habitats possess diverse and abundant shrub and herbaceous vegetation, which in turn support abundant and diverse insect populations. The abundance of food and dense understory in riparian habitats makes them extremely important for forest birds, including those nesting in coniferous forests. Birds nesting in adjacent coniferous forests will frequently visit riparian habitats to find food for hatchlings. For example, high-nutrient foods like caterpillars are associated with broadleaf tree species such as red alder. Riparian habitats also provide significant value for water quality and storage, and soil health. Riparian

Riparian Habitat Cross Section

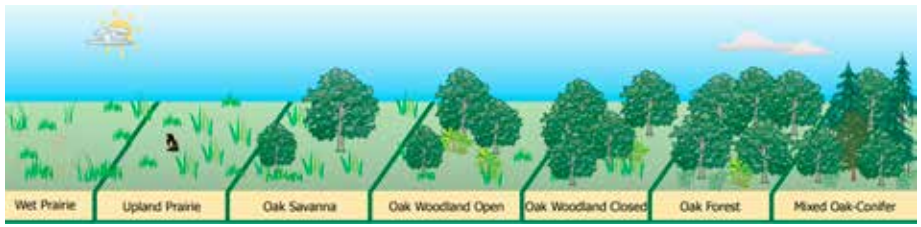
habitats play a vital role in forest diversity, making their inclusion in *Forestry for the Birds* a vital connection between agriculture, hydrology, and forestry.

Oak Habitats

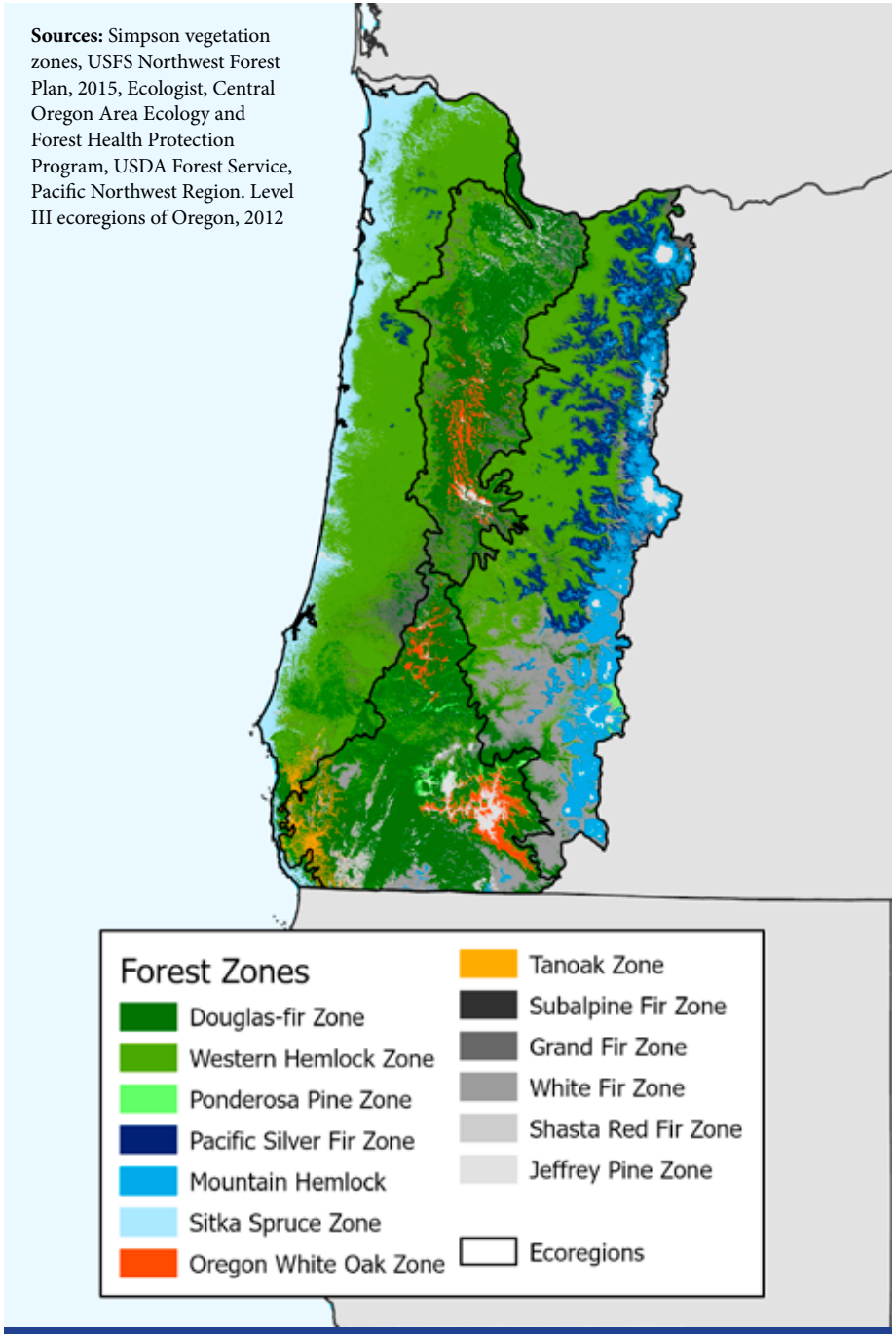
Oak habitats of the region are found in relatively dry, transitional pockets of land situated between prairies and coniferous forests. Through Willamette Valley and into the Klamath Mountain eco-regions most oak trees belong to a single species, the Oregon white oak (*Quercus garryana*). In the Southwest, black oak (*Quercus chyrsolepsi*) tends to be more dominant just north and through the Klamath Siskyious. Historically, low-intensity fires caused by lightning or set by Native Americans cleared out the understory, reducing seedling competition, and favoring fire-tolerant oaks while excluding conifers. This resulted in widely spaced, heavily branched, large, open-grown oak trees with spacious, open understories. In the absence of fire, coniferous forests overtake oak-dominated habitats except in the driest areas. In this way, oak ecosystems exist on a gradient, or successional spectrum (figure below), depending on how they are managed.

This Guide focuses on denser canopy oak habitats, yet it is important to mention oak-savanna, a rare habitat across the Western Oregon landscape. Oak-savanna is an important habitat for many bird species such as Lazuli Bunting, Western Bluebird, and Western Scrub Jay. Though considered a successional stage, depending on management goals this habitat type can be maintained or pursued through the strategic reduction and management of shrubs and conifers.

Successional Spectrum of Oak Habitats



(B.Altman and J.L. Stephens, 2012)



Sources: Simpson vegetation zones, USFS Northwest Forest Plan, 2015, Ecologist, Central Oregon Area Ecology and Forest Health Protection Program, USDA Forest Service, Pacific Northwest Region. Level III ecoregions of Oregon, 2012

Western Oregon Forest Zones

Western Oregon Ecoregions

This Guide primarily focuses on describing forest types and habitats, but it is also important to note that many of these forest types fall within certain ecoregions. Ecoregions are primarily delineated by the geographical extent of vegetation zones with similar climate and other spatial patterns like elevation, soils, land use, and hydrology. Western Oregon is divided into four Ecoregions: Coast Range, Willamette Valley, Western Cascades, and Klamath Mountains. This Guide has maintained the ecoregion reference throughout to help users discern the extent of which forest types and birds occur on the landscape.

Forest Types

The remainder of this section highlights some of the most common forest types found throughout Western Oregon. Each forest type or habitat included in the Guide shares the following guiding information:

- **General characteristics** of the forest type.
- **Dominant tree species** and/or associated tree species most common to the forest type.
- **Shrub species**, that are common to the forest type as well as important for bird habitat. The resources provided by shrubs (e.g., evergreen or berry producing) are important factors in a bird's association with a particular forest type.
- **Herbaceous plants** that occur in each forest type and that are important to many birds providing essential ground cover, nectar, pollen, or seed.
- **Associated bird species** are also included for each forest type. Seeing or hearing these birds will help managers determine if forest habitats are on the way to providing the right conditions for the focal species within this Guide.

Note: Associated species more closely tied with the Klamath Mountains ecoregion will be noted with **.

Sitka Spruce

National Park Service, 2012

The Sitka spruce (*Picea sitchensis*) forest type is limited to narrow stretches of the Pacific coastline, often only a few miles wide, comprising 4.2 million acres. The forest type is characterized by a steady climate with high rainfall and frequent fog or low clouds. Most forests in this zone are at low elevations (less than 500 feet), where tall conifer trees dominate, and hardwoods are usually restricted to river adjacent riparian patches.

Dominant Trees	Common Shrubs	Herbaceous Plants
· Sitka spruce	· Red huckleberry	· Sword fern
· Western hemlock	· Salmonberry	· Oregon oxalis
· Western redcedar	· Devil's club	· Evergreen violet
· Shore/Lodgepole pine	· Salal	· False lily-of-the-valley

Associated Bird Species: Wilson's Warbler, Orange-crowned Warbler, Swainson's Thrush, Rufous Hummingbird, Chestnut-backed Chickadee, Pacific-slope Flycatcher

Douglas-fir/Western Hemlock/Western Redcedar

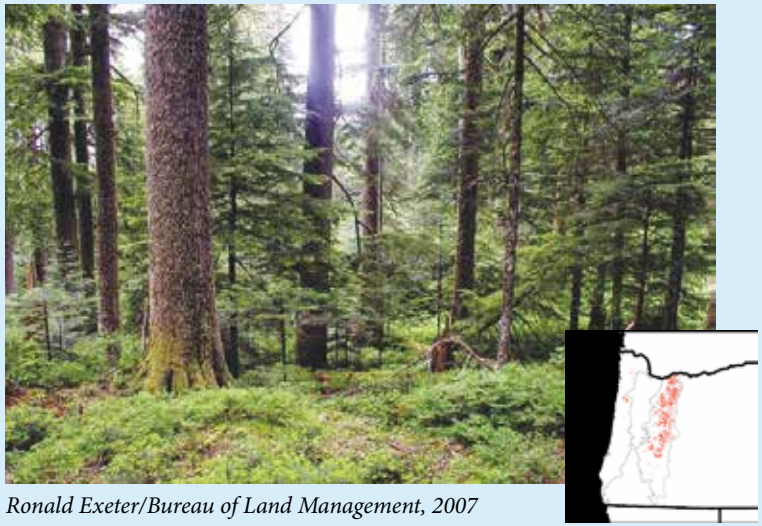
Tualatin Soil & Water Conservation District, 2019

The most common low-elevation forest type in western Oregon, this forest type primarily comprises Douglas-fir (*Pseudotsuga menziesii*), western hemlock (*Tsuga heterophylla*) and western redcedar (*Thuja plicata*). This forest type also overlaps with the region's riparian forests and timber production. For much of this grouped forest type, the climax species is western hemlock and technically classified as such, yet disturbance like logging or fire will turn back the forest clock, allowing Douglas-fir to be the dominate species. Overall this forest type falls within varies in soil moisture content.

Dominant Trees	Common Shrubs	Herbaceous Plants
· Douglas-fir	· Vine maple	· Vanilla leaf
· Western hemlock	· Oregon grape	· Sword fern
· Western redcedar	· Beaked hazelnut	· Trillium
· Grand fir	· Snowberry	· Bunchberry

Associated Bird Species: Pacific Wren, Swainson's Thrush, Hermit Warbler, Pacific-slope Flycatcher, Pileated Woodpecker, Hairy Woodpecker, Band-tailed Pigeon

Pacific Silver Fir



Ronald Exeter/Bureau of Land Management, 2007

The Pacific silver fir (*Abies amabilis*) forests are characterized by dense stands of tall conifers. The midstory will often consist of young silver fir, with a relatively open understory. It occurs at mid-elevations of 2,000-4,000 feet in the Cascade Range, is cooler and wetter than the zone where western hemlock is found, and supports significant winter snowpack.

Dominant Trees	Common Shrubs	Herbaceous Plants
· Pacific silver fir	· Oregon grape	· Oregon oxalis
· Noble fir	· Salal	· Twinflower
· Mountain hemlock	· Vine maple	· Moss
· Douglas-fir	· Huckleberry	· Bunchberry

Associated Bird Species: Hermit Warbler, Stellar's Jay, Varied Thrush, Swainson's Thrush, Pine Siskin, Pacific Wren, Red-breasted Nuthatch

Mountain Hemlock

Peter Hayes, 2011

Mountain hemlock (*Tsuga mertensiana*) is the highest forest type in the region, extending from 4,000 feet to the tree line in the Cascades. Historically, most precipitation fell as snow, with snowpack lasting six months or more. However, the annual snowpack is decreasing with the changing climate. This forest type is characterized by medium-tall conifers, dense forests, and forest patches interspersed with shrublands, meadows, and debris chutes.

Dominant Trees	Common Shrubs	Herbaceous Plants
· Mountain hemlock	· Huckleberry	· Beargrass
· Subalpine fir	· Cascade azalea	· Dwarf blackberry
· Noble fir	· Twinberry	· One-sided wintergreen
	· Vine maple	

Associated Bird Species: Yellow-rumped Warbler, Clark's Nutcracker, Mountain Bluebird, Red Crossbill, Mountain Chickadee, Townsend's Solitaire

Mixed Conifer

Peter Hayes, 2011

The mixed conifer forest type dominates the Klamath Mountains ecoregion which covers most of southwestern Oregon. There are more species of conifer trees found in this region than anywhere else in North America. Tree and understory species at the stand level will vary greatly in this region depending on moisture. Drier soils will have open canopies and sparse understories, while mesic areas will have a higher density of shrubs and more shade-tolerant tree species. Overall, due to historical fire regimes, these forests have complex stand structure.

Dominant Trees	Common Shrubs	Herbaceous Plants
· Douglas-fir	· Common juniper	· Idaho fescue
· White fir	· Pinemat manzanita	· Queencup bead lily
· Ponderosa pine	· Bitter cherry	· Rattlesnake Plantain
· Incense cedar	· Dwarf rose	· Tufted pinegrass
· Pacific madrone	· Serviceberry	

Associated Bird Species: Hermit Thrush, Hutton's Vireo, Hammond's Flycatcher, Band-tailed Pigeon, Nashville Warbler, Western Tanager

Riparian Habitats

Tualatin Soil & Water Conservation District, 2019

The primary feature of riparian habitats is flowing water. This includes seeps, springs, and intermittent streams. This complex habitat exists across all elevations and ecoregions, and while features will vary across the landscape (e.g., buffer width, forb species, stream width), they also maintain many associated species and structure. Common features like dense understory, dominant deciduous trees, and greater plant diversity provide essential habitat for the birds that nest in this habitat and adjacent forests.

Dominant Trees	Common Shrubs	Herbaceous Plants
· Western redcedar	· Salmonberry	· Tufted hairgrass
· Red alder	· Pacific ninebark	· Sedges and rushes
· Oregon ash	· Red-osier dogwood	· Lady fern
· Big-leaf maple	· Vine maple	· Piggyback plant
· Black cottonwood	· Willows	· Waterleaf

Associated Bird Species: American Dipper, Yellow Warbler, Willow Flycatcher, Downy Woodpecker, Warbling Vireo, Song Sparrow, Black-headed Grosbeak, Western Wood Peewee, Northern Flicker

Oak-Conifer

Maura Olivos/Forest Stewards Guild, 2022

Oak-conifer habitats vary by ecoregion. Oak-fir are typically closed-canopy with Douglas-fir as the dominant conifer and Oak-pines are mostly open canopy, with ponderosa pine (*Pinus ponderosa*) in the Klamath Mountains. Both habitats will have an even mix of oak and conifer in the canopy. These forests are a natural community type that occur at elevations where foothills transition into conifer-dominant forests, or as a result of fire suppression followed by conifer encroachment. Oak-conifer forests may include dead or dying oaks due to competition with the fast-growing conifers within the understory.

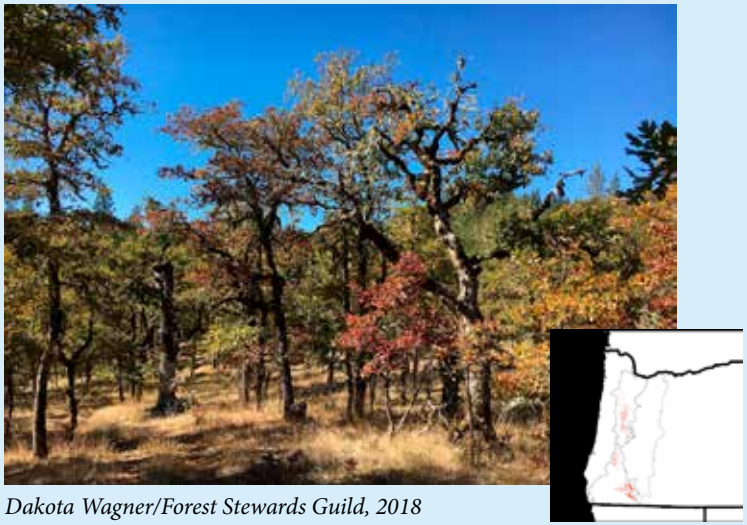
Dominant Trees
- Oregon white oak
- Douglas-fir
- Ponderosa pine

Common Shrubs
- Snowberry
- Oceanspray
- Oregon grape
- Ceanothus**

Herbaceous Plants
- Blue wildrye
- Hairgrass
- Wild Oregon iris
- Woods strawberry

Associated Bird Species: Black- throated Gray Warbler, Western Tanager, Western Scrub JayAcorn Woodpecker, Lewis' Woodpecker, Cassin's Vireo

Oak Woodland



Dakota Wagner/Forest Stewards Guild, 2018

Oak woodlands are characterized by an oak dominated canopy that can be open (25-50% cover) or closed (50-75%) with between five and 30 large trees or more per acre. Oak trees tend to be more columnar as compared to open-grown trees in savanna and the understory is dominated by shrubs and short, small trees. Oak woodlands are generally found on drier, south facing slopes within lower elevations.

Dominant Trees
- Oregon white oak
- Big-leaf maple
- Pacific madrone
- California black oak**

Common Shrubs
- Snowberry
- Poison oak
- Ceanothus**
- Osoberry

Herbaceous Plants
- Junegrass
- California brome
- Camas
- Common biscuitroot

Associated Bird Species: Acorn Woodpecker, Western Scrub Jay, Slender-billed White-breasted Nuthatch, Chipping Sparrow, House Wren, Western Wood-pewee.

Section III

Forest Birds

This section is all about birds: viewing the landscape from a bird's-eye view, understanding how they live in a forest, and how to identify them. At the end of the section, you will find the 12 focal species selected for *Forestry for the Birds: Western Oregon*.

Connecting Forests: A Bird's-Eye View

When birds look down on the landscape from above, they see continuous forests and forest edges with other habitat much like we do, but they don't regard units of ownership or management as such. How patches of habitat are connected or divided on a landscape and how these individual passages of habitat interact from small to large scales are important considerations for the health of waterways, forests, and wildlife. Then understanding how your stand fits into the bigger story of forests and resources in your region. It can be useful to take this aerial view of the forest and landscape when considering where different resources are found and how birds or other organisms use these resources over the course of a year. Species differ in the resources they need, and generally, the species that are common now are telling you which resources are abundant in the landscape. Looking at your stand from a bird's-eye view can lead to insights about the habitat your forest offers. For example, some resources like oak forests, do not occur evenly or continuously across the landscape, thus supporting or connecting patches of such habitats can benefit the bigger picture of landscape-scale bird populations and ecoregion health.

The Lives of Forest Birds

Watching bird behaviors such as foraging, nesting, and migrating reveal the types of resources and habitat specificities that forests provide. Birds, like humans, have complex behavior and patterns. However, it can be hard to predict which behaviors or preferences are flexible and which are not. For example, Song Sparrows will nest in many kinds of low shrubs as long as there is decent cover above and preferably grass below. In contrast, Warbling Vireos hanging basket nests are in the fork of a branch whose twigs are roughly 2 millimeters in diameter, in the canopy of deciduous trees near or over water. A key idea here is that each species has a set of preferences and characteristic behaviors uniquely its own. This "tuning" of habits and abilities contributes to the ways birds divide resources in a patch of forest. Birds also use distinct aspects of a forest and landscape differently depending on the time of year and phase of the annual cycle (e.g., establishing territories, raising young, migrating, overwintering).

Jerry McFarland/Creative Commons, 2016

Where Birds Live: Breeding and Nesting Behavior

Forests are nurseries for future bird populations. Each species seeks sites in a forest that help individuals avoid predators, maintain moderate nest temperatures, and fledge young each year. For most bird species, females select nest sites and build nests within the territory of a singing male.

If your bird-watching includes nest-finding, these tips might help:

1. Find the female bird and watch her closely. If she has eggs, she will need to return to the nest relatively quickly to incubate them. Similarly, if you spot a bird traveling with food (for chicks in the nest) or any kind of plant material in its beak (for building a nest), it is heading to a nest.

2. Watch the female bird for as long as you can, noting where you lose her each time. The challenge is to keep watch from a sufficient distance such that she is not alarmed yet close enough that you can watch her until she returns. If you find a nest, be careful not to beat a trail to it through grasses or understory vegetation. The visual and scent cues you leave can inadvertently lead nest predators to explore these sites, too.

What Birds Eat: Diet, Foraging Behavior, and the Forest Ecosystem

Birds exhibit a diversity of diets and play an essential role in the ecosystem by virtue of what they eat, where they catch it, how they catch it, and where they go after eating. Most neotropical migrants eat insects for at least some portion of their lives. All birds need protein to grow and molt, and insects are incredibly abundant sources of energy. Worldwide estimates indicate that birds eat between 400 and 500 million metric tons of insects and spiders annually. Birds forage for insects in various ways, including leaf gleaning, flycatching from a perch, and hunting for insects in flight.

Bird behavior will also promote forest function. Foraging plays an essential role in healthy forest ecosystems. For example, while searching for insects Pileated Woodpeckers create cavities in living or dead trees that create nest habitats for other cavity-nesting birds. Other birds such as hummingbirds and some warblers disperse pollen while consuming nectar. Fruit-eating birds, like Band-tail Pigeons, thrushes, and chats disperse seeds of fruit-bearing trees and shrubs.

Tualatin Soil & Water Conservation District, 2016

Where Birds Go: Through Forests and On Migration

Birds move through forests differently over the course of a year.

1. **Finding a home**: When birds first return to the breeding grounds from migration, they begin exploring potential habitats. In this period, birds assess patch size, quality, availability, and the density of other birds using similar resources. These factors help determine the size of a bird's territory and how vigorously males may sing or display.

2. **Breeding season movements:** After breeding territories have been established and females are nesting, mating pairs typically stay within their territory. The perches from which the male sings can be seen as "sonic fence posts" along an imaginary perimeter. When most songbird chicks hatch, adults provide young with spiders and insects. Sometimes, this means a commute to riparian waterways embedded within coniferous forests where food is more abundant.

Jacob Frank/National Park Service, 2015

3. **Out of the nest:** After fledging, young birds are often provisioned briefly by their parents (1-3 weeks) in or near their home territory. Young birds then "wander" locally (up to 150 miles), finding food, preparing for migration, and exploring. This period helps young birds develop a regional-scale map for future habitat selection and migration. Many birds shift habitat and even diet after the breeding season has ended and before migration begins. This may include subtle shifts or movement into completely different habitats. For example, some species that breed in mature, interior conifer forests will move their young to younger forests and deciduous patches before migration. Thrushes will demonstrate this behavior by leaving the forest edge to fatten up on crops of berries in open patches, Rufous Hummingbirds undertake short migrations into mountainous areas tracking wildflower blooms before heading south, and some species of birds, such as Vaux's Swifts, gather in premigratory staging sites. These movements underscore the importance of having various bird-friendly forest patches in the landscape.

4. **Migrations:** Approximately half of the birds on the *Forestry for the Birds* focal species list travel long distances to Mexico and Central America, or even South America like Swainson's Thrush. Some birds, like Rufous Hummingbirds, migrate in short flights, stopping to eat, recover, and fatten up before flying again. Although they don't migrate long distances, many resident birds still move short distances and change their foraging behavior or habitat use seasonally. In the Pacific Northwest, most species migrate south from early August to late October. Spring migration north typically takes place between February and May. Interestingly, over 80% of migratory land birds migrate primarily at night. They must time their migrations with fair winds and weather, find places to rest and refuel, and navigate around light pollution and other sensory obstacles. Private forests may serve as light-free buffers around metropolitan areas within river corridors or coastal regions.

How to Identify Birds

Anyone can identify birds with the right resources. It is helpful to start with a few basics on recognizing the traits that distinguish one bird species from another. This Guide will assist in identifying focal species for the region's forests, but not as a complete guide unto itself. This Guide should be a complement to other standalone bird guides.

Tools of the Trade

Forest birds encountered in the spring and summer are most often heard before they're seen. Even under the best of circumstances, many birds do not stay still for long or pause for a thorough cross-examination. Therefore, it pays to learn the sounds of the woods! When its possible, try to match the sounds and songs of the birds you are hearing to the birds you are seeing until you are familiar with both. It helps to have the following items:

- **Binoculars**, preferably something in the 8x42 range. The "8" indicates the magnification of the image is 8x, and the width of each lens is 42mm, which gives you some idea of how much light can enter.
- A **bird guide**, such as the Sibley Guide, National Geographic's Birds of North America, or Audubon's Guide, is invaluable for learning to identify birds. In addition, many electronic guides have audio files associated with each species (e.g., Sibley Guide 2.0). Cornell Lab of Ornithology's *All About Birds* provides online identification support with audio files of bird sounds from the Macaulay Library. Apps such as Merlin and eBird can also be a handy way to keep a guide in your pocket on your phone and keep track of your observations.
- **Notebook and pencil** or pen to record the date, time, location, species, numbers of individuals, characteristics, and behaviors of the birds you see.

Categorizing Birds

There are seven characteristics to look for when identifying a bird:

1. **A group** refers to the broad classification that a specific bird belongs to. Visible similarities among species help identify kinds of birds, such as hawks, herons, woodpeckers, and so on. A slightly more challenging grouping might be those classified as like another group such as "sparrow-like birds" which includes sparrows but also blackbirds and towhees. Recognizing the group a bird belongs to often gives you an idea of where to look in a field guide.

2. Field guides often start with **size** as an identifying factor: is it bigger than a loaf of bread? Is it smaller than a softball? General **shape** is also a common indicator. Note the kind of beak it has, the size of the feet, the shape of the tail, and the type of flight it uses (often indicated by the shape of the wings in conjunction with the behavior of flight). For example, a "little brown bird with a needle-thin beak as long as its head with a tail that's always cocked" is probably a wren.

3. **Field marks** are the details of birds that help distinguish one bird species from another that might resemble it. Field marks are primarily visual: feather color, skin and leg color, eye color, coloration patterns on the bird's head. However, field marks can also include behaviors (like wagging a tail in a particular direction), habits (skulking low in sword ferns), and vocal traits (at the end of a long robin-like song utters the phrase "pdick!").

   A reminder: It is common for males, females, and juvenile birds to differ in field marks and plumage, vocalizations (in most birds, only males sing), some behaviors, and occasionally preferred habitats such as song perches and nesting habitat.

4. **Call or song** describes the way the bird sounds using a combination of vocal phrases and the rate at which it delivers its notes, phrases, and songs. Many bird species may have more than one song or variations of a general song form. There are many ways to memorize or distinguish one song from another. For example,

it may help to remember mnemonic catchphrases that a bird might sing, like Brown Creeper's singing "trees-trees-beautiful-trees." Alternatively, you may feel comfortable jotting down notes graphically to remind yourself of the rise and fall of the song phrase. You may also be able to look at sonograms that show the frequency, phrasing, and amplitude of a song and compare these to what you have observed.

5. **Behavior** is a broad category that includes how a bird eats, flies, hops, flicks its tail, acts socially, responds to threats, and so on. An example could include the skulking way a Swainson's Thrush observes you from dense understory, hopping low in the brush from branch to branch before blasting silently down the trail and into another dense thicket of vegetation. Compared to other birds in the same Thrush Group (Turdidae) that are often seen flying and foraging in the open such as robins, Swainson's Thrush behavior is distinctly not robin-like.

6. **Habitat** describes where a bird is seen in a forest: in the understory, flitting in the canopy, at the edge of a habitat, and so on. Habitat includes a combination of the structural characteristics, successional stage, and vegetation types. The focal species section of this Guide addresses habitat elements in greater detail.

7. **The season** when a bird is detected is helpful for identification. Birds are often seen in different parts of their migratory habitats during different parts of the year. For example, birds arrive at breeding grounds at different times, with local or resident birds showing up in the spring and long-distance migrants later in the summer. Detection and identification of birds is easier early on in each species' breeding cycle because birds sing more upon their arrival to breeding grounds and less as the season wanes.

Tips for Identifying Birds by Sound

Bird songs and sounds are essential to identifying bird species in dense forests where songs are plenty, but clear views of birds are few. It can be challenging at first. The key is finding the telltale motifs in songs unique to each species and detecting the slight differences separating similar songs. This task is made easier with practice and by listening to audio recordings of bird songs.

Song

Three techniques we'll use in the species account pages include:

- **Vocal quality**, which is "what the bird's voice sounds like." Musically, this is more akin to the timbre of an instrument. For example, a Black-headed Grosbeak's voice is more forceful, like a penny whistle with a slide, sometimes with a husky or wheezy quality, whereas a robin's voice is more fluid, flute-like, and rounded.

- **Tempo** refers to the song's *pace*, the rate notes are delivered, and the sequence and speed of phrases in a song. A simple example is the trill of a Dark-eyed Junco. Trills are a simple form of tempo in which a bird repeats a set of simple phrases. The junco's song is a sustained trill (neither rising nor falling) and mostly monotonic. In contrast, an Orange-crowned Warbler song is a trill that accelerates and seems to rise (or fall) in pitch.

- **Pitch**, as it is in music, indicates the sonic frequency of the notes. Are they high, like notes in the warbly trill of the Pacific Wren, or low, husky, and booming like hoots of a Band-tailed Pigeon?

Once you gain some familiarity with a group of songs, you can start to tease apart differences in pitch, quality, song sequencing, and tempo. These differences can help you identify birds through dense vegetation and from a distance.

Calls

While it is mostly male birds that sing during the breeding season, all birds issue call notes. Therefore, learning call notes will help identify birds by sound in seasons when males are not singing. In some cases, the calls that birds use may be as helpful as a song to indicate species identity. In other cases, the combination of call and song together can help distinguish some species whose songs may be otherwise similar-sounding. For example, Song Sparrow chip notes sound nothing like the growled churs and chucks of a Bewick's Wren, though many aspects of their songs can sound similar.

Forest Stewards Guild, 2021

Focal Bird Species in Western Oregon

Pileated Woodpecker

Brown Creeper

Varied Thrush

Pacific Slope Flycatcher

Pacific Wren

Hermit Warbler

Wilson's Warbler

Acorn Woodpecker

Rufous Hummingbird

Swainson's Thrush

Band-tailed Pigeon

Black-headed Grosbeak

We selected these focal species to bring attention to forest features essential to recognizing and managing that specific habitat's overall health and function. Thus, our first criteria for selecting bird species was to identify habitats and habitat features to emphasize throughout Western Oregon. We then selected species based on a blend of four traits:

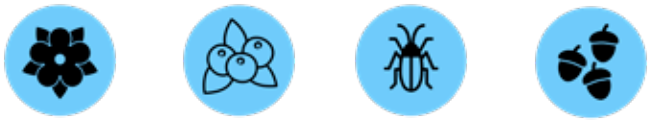
1. Birds that are associated with a particular habitat and forest features.
2. Birds that are common, charismatic, and relatively easy to identify by sight, sound, or behavior.
3. Species that carry out essential forest functions such as pollinators, seed dispersers, or habitat engineers (e.g., cavity excavators).

4. Where possible, we prioritized species whose global distribution is restricted to northwest forests or common species that have experienced recent and sharp declines in population size. Learning these selected focal species can act as a gateway to the expansive world that is bird habitat appreciation and management.

Species Accounts

Each of the focal species is described in detail on the following pages. These accounts include a photo for identification, a description of each birds' characteristics and sounds, and strategies for enhancing habitat for the species. Each account also includes at least one icon from each of the categories below to identify key habitat needs.

Diet Icons



Floral Nectar | Fruit & Berries | Insects | Nuts & Seeds

Habitat Icons

Early Successional | Riparian | Oak | Mature Conifer

Nest Icons

Cavity | Cup | Dome

Migration Icons

Migrant | Resident | Partial Migrant & Resident

Additionally, we've created habitat feature cross-sections that highlight the key habitat characteristics each species is looking for in the forest. The cross-sections illustrate the key habitat features to recognize and enhance for each species. They also indicate where you are likely to find the birds' nests.

Layers

The dotted yellow lines divide the layers of the forest.

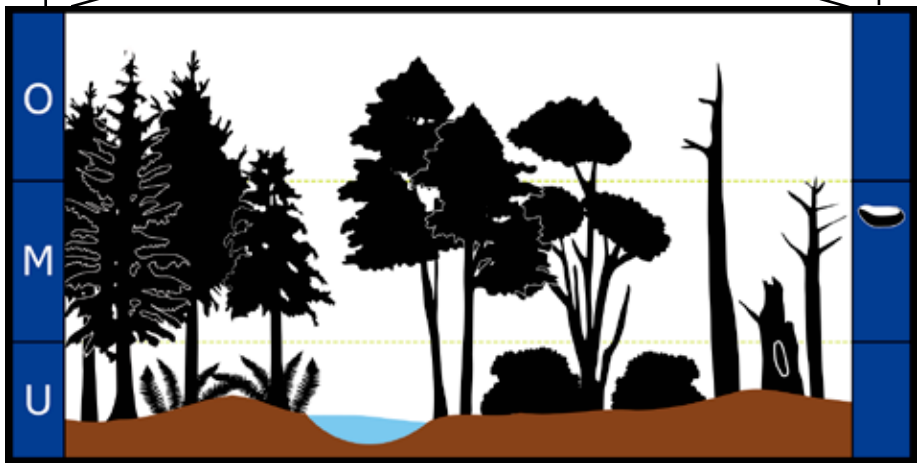
- O - Overstory
- M - Midstory
- U-Understory

Nest Location

The blue column on the right indicates the nest type and the layer where you will likely find the nest.

Features

Each cross-section includes the key habitat features for that species.



Pileated Woodpecker

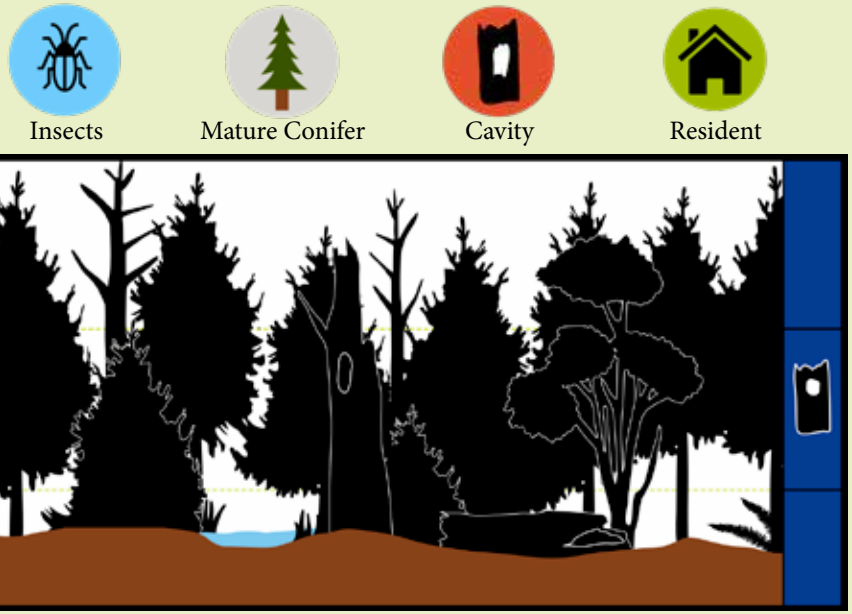
Photo Credit: Mick Thompson/CC

These crow-sized woodpeckers flash bold patches of white under their wings and a bright shock of red feathers on the crest and mustache of males. They are primary excavators of large snags, using the cavities they create to nest and providing cavity sites for a host of other species that use large snags in older conifer forests.

The woodpecker's call is a powerful, booming repetition of monotonic "kek" notes, similar to a Northern Flicker but louder. They favor large territories (about 250 acres) and large diameter snags and fallen trees, making them uncommon birds in smaller, more isolated forest patches.

How can I enhance habitat for Pileated Woodpeckers?

Retain large-diameter legacy snags and large live trees (greater than 20 inches in diameter). Also, retain wonky or defective trees with broken tops, fungal conks, and insect infestations, and leave large logs and stumps in various states of decay during harvest operations.



Brown Creeper

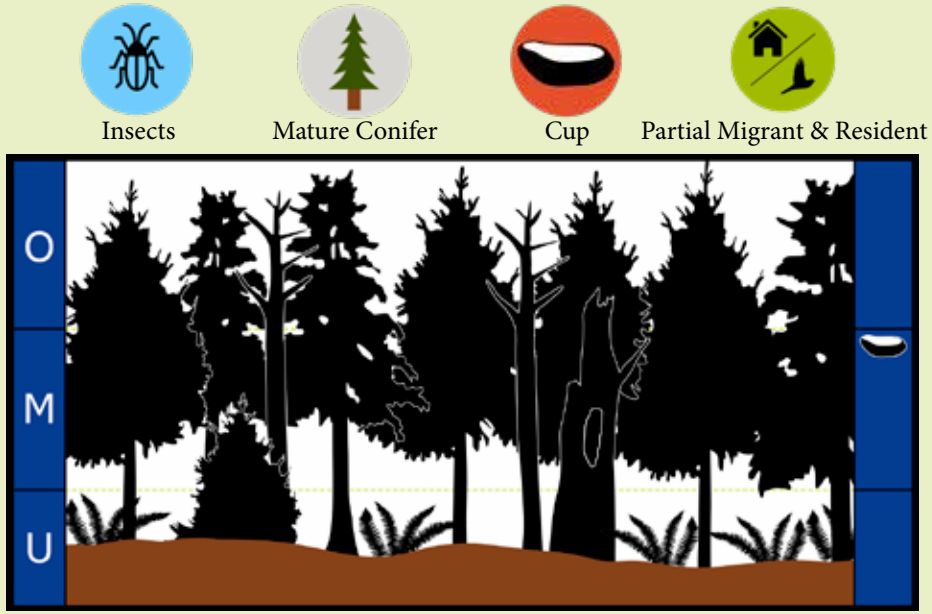
Photo Credit: Mick Thompson/CC

A busy and stealthy brown bird with a slightly down-curved blackish beak and a long tail with stiff, pointed tail feathers, easily overlooked on the sun-dappled bark of large conifers. Their songs are high and thin strains that seem to say "trees-trees-trees beautiful-trees," accelerating and descending on the last two notes.

Primarily associated with mature conifer and relatively large tracts of continuous forests containing large-diameter snags with large branches and sloughing bark for nesting. They are bark-gleaners and spend most of their time scaling up tree trunks and branches year-round in the Pacific Northwest.

How can I enhance habitat for Brown Creepers?

Retain or create snags essential for nesting in mature forests with bark remaining (average nest tree diameter 28 inches at breast height). Maintain as much continuous mature forest as possible. In harvest units, retain trees in clumps (retention aggregates) and emphasize trees with deeply furrowed bark for more foraging opportunities.



Varied Thrush

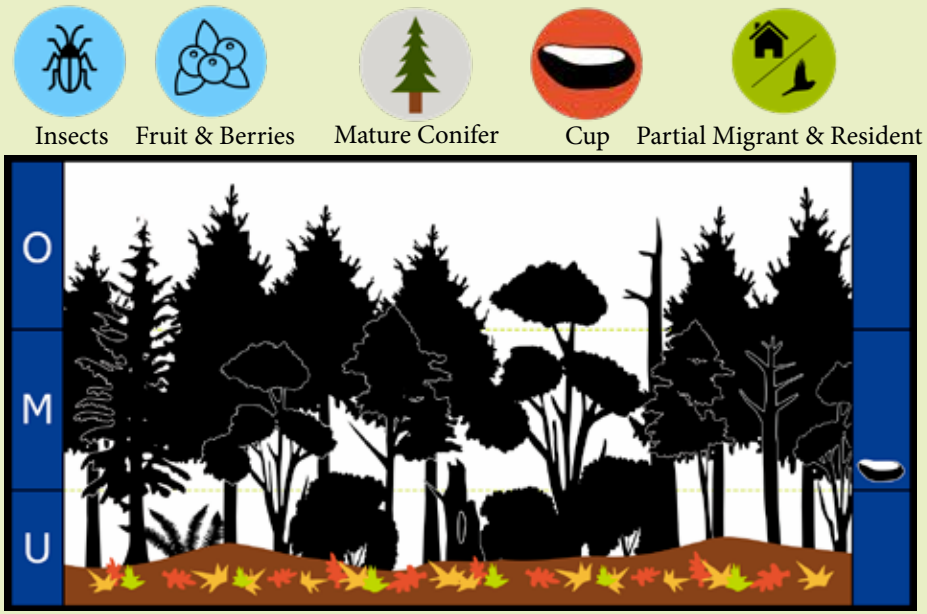
Photo Credit: Mick Thompson/CC

Like robins, they are chubby and short-tailed. They have stunning orange and slate-colored features with a black mask, crown, and breast band. During the breeding season, they will nest and forage in moss-covered branches in the mid-canopy of mature conifer forests.

Their song is eerie and penetrating, with a buzzy plaintive whistle rich in overtones, drawn out over two seconds ("vree"). They are insectivores in summer and consume berries in fall-winter therefore functioning as seed dispersers. They are also frequently seen foraging in leaf litter in younger forests and urban areas during migration.

How can I enhance habitat for Varied Thrush?

Favor large patches of continuous forest (75 acres or more) with high canopy closure (70%) and multi-layered forest with a mix of coniferous and deciduous trees. Light to moderate thinning may augment the growth of desired age class and species composition of trees and native berry-producing shrubs like Pacific madrone and elderberry.



Pacific Slope Flycatcher

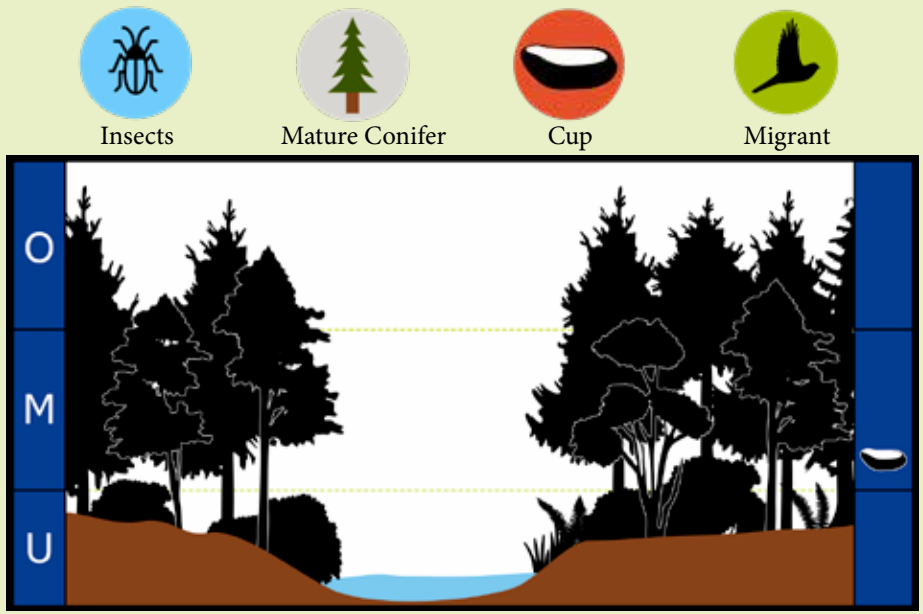
Photo Credit: Becky Matsubara/CC

A smallish-greenish flycatcher, that is very abundant but not very obvious, with an enlarged white eye-ring. These flycatchers prefer conifer forests with large middle and low-level canopy gaps with deciduous trees in the canopy and subcanopy. Frequently found on slopes near water, they fly out into light-filled gaps to catch insects.

Their song is a cheery set of variably-paced whistles and pips that slide together ("tsee-put"), much like a person hailing a taxi, then squeaking at the quoted fare before hailing another.

How can I enhance habitat for Pacific-slope Flycatchers?

Maintain small patches of deciduous trees and shrubs and create/maintain small canopy gaps by thinning young forests (less than 20 years old) to minimize canopy closure. The initial response to thinning may result in lower numbers, while abundance increases over 10-20 years post-thinning. When thinning, minimize damage to shrub cover. Provide a riparian buffer of at least 50 yards around water.



Pacific Wren

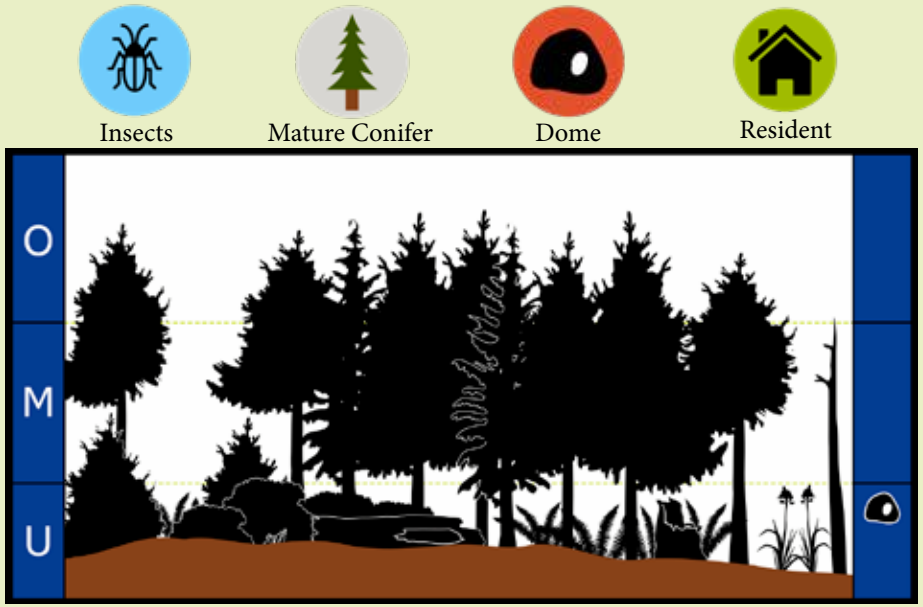
Photo Credit: Tom Talbot Jr. /CC

A small dark wren with rufous and chocolate overtones and a very short, frequently cocked tail, this bird is an impishly inquisitive mainstay of the fern-clad, moss-soft tumble of the forest floor. They glean all varieties of insects from complex understories of a variety of forest habitats. They are also surprisingly effusive songsters.

They produce a riotous river of fluty burbles bursting forth in a five to ten-second stream of notes oscillating between high and low, punctuated by staccato call notes barked between songs. For small birds, they have large territories (approximately 2.5 acres per pair), prefer interior forest, and are often found near small streams.

How can I enhance habitat for Pacific Wrens?

Maintain woody debris and root wads during harvesting. Conduct light, variable-spaced thinning to enhance understory vegetation. They prefer a combination of patches with high-light understory and closed-canopy over an even distribution of both. Maintain large tracts of contiguous forest that minimize edge.



Hermit Warbler

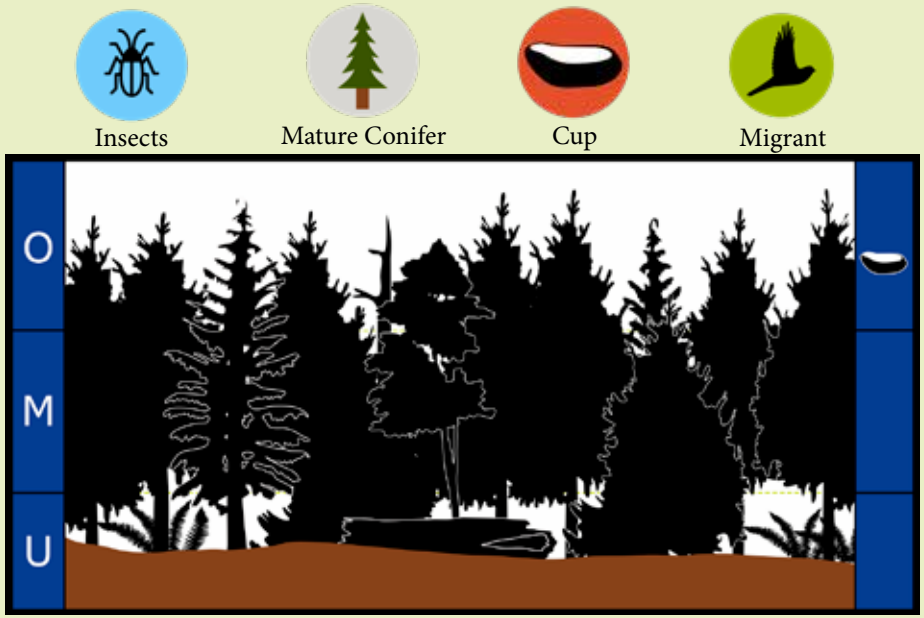
Photo Credit: Frode Jacobsen, USFWS/CC

Highlighted by a blazing yellow head, black throat, beak, and eye, and a white breast unlike any other warbler in the forest, they are denizens of the closed and copious upper canopy in mature conifer forests. Thus they are often first detected by their song, which is variable, and sometimes confused with Townsend Warblers.

Their song is generally recognizable for their 5-9 buzzy combinations, such as "zeedly-zee-ZEEE-zoo." These warblers are among the most abundant in the Pacific Northwest and commonly found with other closed-canopy species.

How can I enhance habitat for Hermit Warblers?

Deep, structurally complex crowns are an essential feature of the closed canopy these birds prefer. Light to moderate thinning early in forest development can enhance the development of large crowned trees. A 65% mature (greater than 40 years) to 35% young forest ratio is desirable, with a majority Douglas-fir canopy that is 90% closed.



Wilson's Warbler

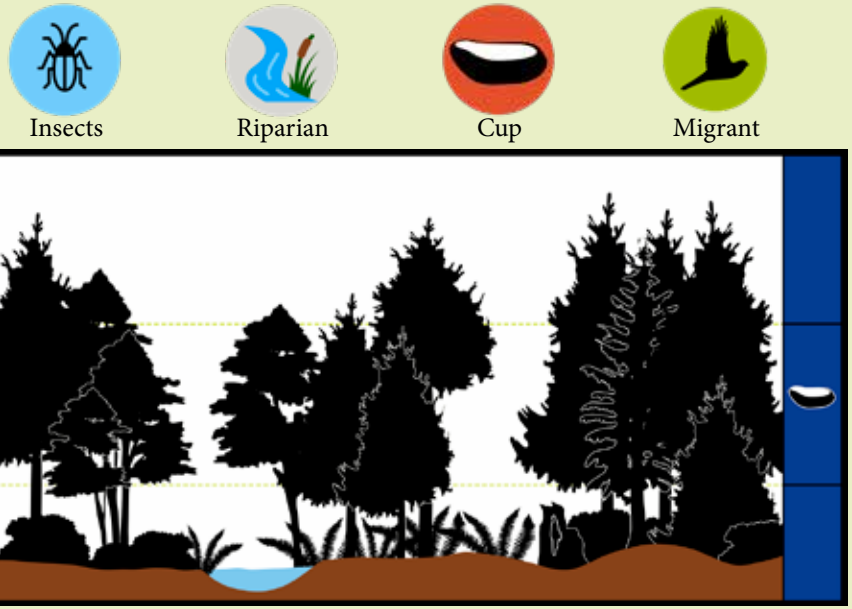
Photo Credit: Mick Thompson/CC

A small, bright yellow wood warbler with big black eyes and a crisp black cap is an inquisitive and active resident of dense deciduous understories where young forests abut mature. These leaf-gleaning insectivores are distinctive both by sight and song.Their song is a series of loud, accelerating notes that drop slightly in pitch as they increase their volume, like a tiny, stuttering jackhammer, or a sewing machine.

They are common birds in coast range forests, but numbers have declined notably over the last 30 years, possibly due to suppression of deciduous vegetation in heavily managed coast range forests.

How can I enhance habitat for Wilson's Warblers?

Nurture deciduous or mixed conifer-deciduous understories in late early successional tracts adjoining mature forests. Thinning can encourage shrubs, ferns, and small hardwood trees like dogwood or vine maple in younger, even-aged stands.



Acorn Woodpecker

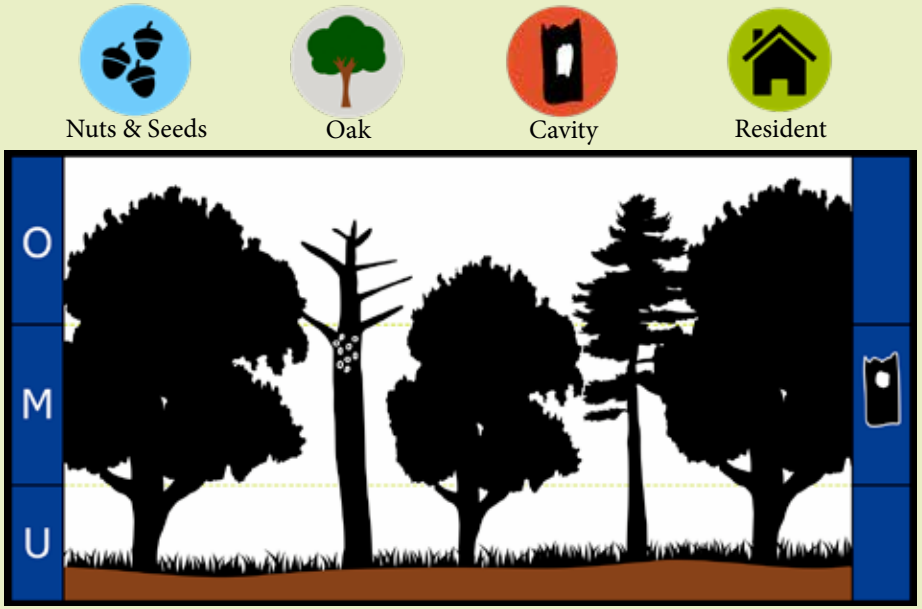
Photo Credit: Nagarajan Kanna/CC

Find this social woodpecker where acorns and snags are plentiful. Clownish and noisy, their squawky "waka-waka" calls fill the canopies of oak woodlands throughout the west. They are striking to look at, with a pale eye, white wing-patches, red cap, and a green sheen within its black nape and back.

This curious species breeds in groups, with multiple males and females working together to raise young in a single nest. Young birds remain with their family for several years and help their parents rear future broods. Each year, they store thousands of acorns in larders or "granaries" by hammering them into specially made holes in trees or snags. These granaries form vital reserves that support a group when food resources are scarce.

How can I enhance habitat for Acorn Woodpeckers?

Maintain mature oak woodlands with some closed canopy and large diameter oaks. Create or retain snags.



Rufous Hummingbird

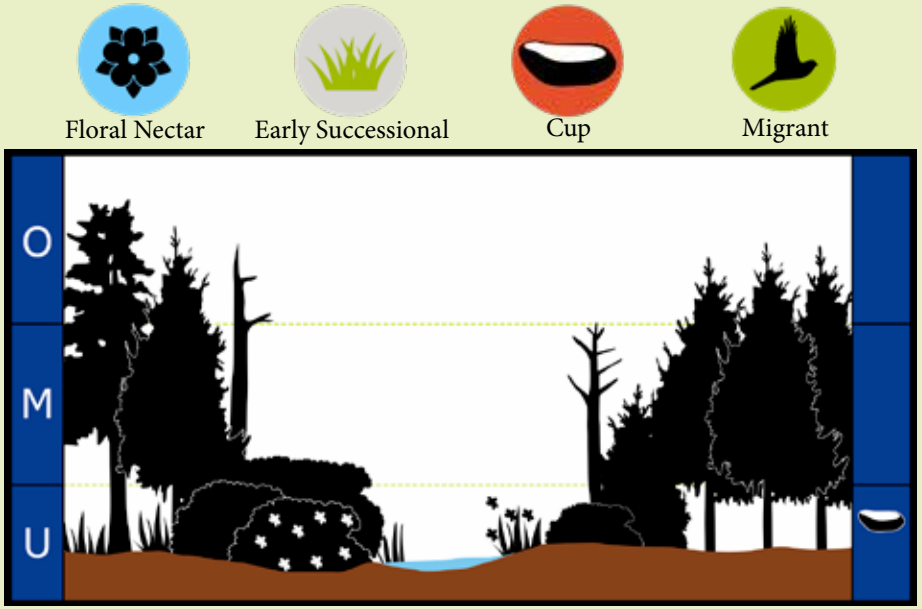
Photo Credit: Mick Thompson/CC

Often glimpsed in transit from a flower, their hovering flight is mesmerizing as males pivot and accelerate with spritely grace and a fiery verve. Showy male hummingbirds are often seen defending large clumps of flowers, while the more subtle green-backed females dart amid the branches of conifers and shrubs.

They don't sing but their hovering flight produces the "humming" sound for which they are named. Males conduct an elaborate diving display in the shape of a "J" that produces a buzz and "zwee" sound. Find them in high light locations with abundant flowering shrubs and water nearby. Females construct nests out of spiderweb, lichen, and moss attached to low conifer branches.

How do I enhance habitat for Rufous Hummingbirds?

Maintain deciduous vegetation where conifer seedlings are not planted. Retain and plant shrubs in forest edges and clearings. Allow early-successional habitat to regenerate where there is the potential for flower-producing plants.



Swainson's Thrush

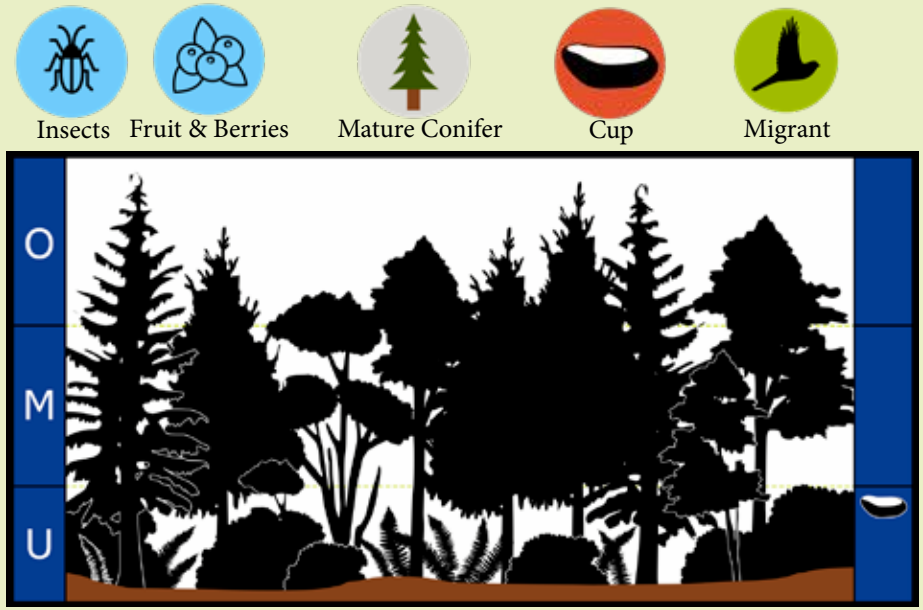
Photo Credit: Mick Thompson/CC

A shy understory bird with large dark eyes, this thrush has a haunting song that starts with a single soft note followed by an upward-spiraling set of notes that echoes through the forest. These birds forage and nest in dense vegetation, often near water, in riparian and conifer forests where old shrubs or small trees are plentiful.

In the fall, they shift their diet from insects to fruits and berries, serving as important seed dispersers for various shrubs and hardwoods.

How can I enhance habitat for Swainson's Thrush?

Foster conditions that support a mature shrub layer. Thin young stands to allow light through the canopy and create canopy gaps. Plant deciduous trees and shrubs (e.g., vine maple, red elderberry) and limit herbicide treatments.



Band-tailed Pigeon

Photo Credit: Becky Matsubara/CC

A large forest pigeon with a pinkish-purple cast to the gray head, a white band above a metallic green-bronze patch at the nape of the neck, and yellow legs, frequently seen bolting powerfully across the sky in many suitable forests.

What makes a forest suitable for these pigeons is a peculiar blend of features: relatively large conifer trees for nesting, sizable light gaps for an abundance of fruit trees and shrubs, especially elderberry. These forest pigeons have also been seen in studies to frequent mineral springs or seeps rich in calcium, salts, and phosphorous. Their song is a short series of paired "whoot-woo" and low booming notes.

How can I enhance habitat for Band-tailed Pigeons?

Plant and maintain berry, fruit, and mast-producing shrubs and trees through thinning and targeted use of herbicides. Maintain forest cover around mineral seeps and springs.

Nuts & Seeds

Mature Conifer

Cup

Partial Migrant & Resident

Black-headed Grosbeak

Photo Credit: Mick Thompson/CC

Aptly named, males possess an enormous grayish beak and black head, cinnamon-splashed breast, and bold white wing patches seen in flight. The female looks different and has a brown back and head, white eye-stripe, light orange chest streaked with brown, and enormous brown beak.

Both males and females incubate eggs in nests placed in tall shrubs, and both can sing. Their song is a forceful series of whistled phrases that rise and fall in couplets, reminiscent of a robin's. The telltale feature of a grosbeak's song (separating it from similar American Robin and Western Tanager songs) is an interjection of a "peek!" call note between phrases or songs. They eat a varied diet of insects, seeds, and fruit, serving as occasional seed dispersers.

How can I enhance habitat for Black-headed Grosbeaks?

Promote hardwoods and tall shrubs in regenerating conifer forests for nesting and foraging. Minimize herbicide use, and establish wider (70 yards) riparian buffers around waterways.

Insects

Mature Conifer

Cup

Migrant

Section IV

Managing Forests with Birds in Mind

Forestry for the Birds provides a path for landowners to pair management goals with bird habitat features from stand, to property, to landscape level. Forest management can accomplish economic income goals, long-term resilience goals, and recreation goals while benefiting forest bird habitats.

Intensive management has shifted the structure and average age of many Douglas-fir forests in the Pacific Northwest. The fire ecology of the Pacific Northwest is also changing, with more large fires in the last 20 years than there had been in the previous 100 years. Landscapes of the past were dotted with patches of younger forests, burn scars, landslides, and treefall gaps in a matrix of old forest. Hotter, drier, longer summers combined with urban growth have led to more frequent and intense forest fires. These changes, along with intensive management, have generated more young and middle-aged forests and smaller patches of forested land.

The changes to forest structure and composition over the last 150 years have resulted in a patchwork of migratory bird populations. Suitable habitat does not rely on the successional stage alone. The quality and complexity of a forest habitat's features play a complex and crucial role in supporting bird populations. Thoughtful forest management is needed to make space for enhancement or construction of forest structure for each stage of a forest.

How to Manage Forests with Birds in Mind

Managing forests with birds in mind can be broken down into six steps:

Setting Goals

People own forests for a variety of reasons. Some have inherited long-time family-owned land while others have recently acquired forestland. Some rarely visit their woodland, while others intimately know the trees and terrain. A growing number of landowners enjoy the recreational value of their forestland (wildlife viewing or hunting), while others view timber revenue as a primary and crucial component of the land. This Guide helps bridge compatibility between the qualitative values of wildlife, recreation, and scenic beauty with the financial benefits of timber by providing a long-term perspective that factors in a changing forest.

Assessing Habitat

Forest management plans include a description of the forest stand conditions. In addition to measuring timber volume, these stand descriptions can include assessing the habitat value in different areas. For example, a forest inventory can include an estimate of dead and dying trees for suitable habitat. Also getting to know the birds on your property can help you understand how they utilize forest features and assess habitat. Landowners, managers and practitioners may also ask: How healthy are the trees in your forest? What kind of habitat does the forest provide, and how much quality habitat is used by birds and other wildlife? What seems to be missing?

Picturing the Future Forest

Based on the current state of the forest, a forester can provide recommendations for forest management options that put the forest on a path toward fulfilling the landowner's goals. What would you like to see in your forest? What birds will benefit from thoughtful tending of the woods? When picturing the future forest, it is important to imagine what the woods will look like at all stages: right after a harvest, five and ten years later, and decades later. The forest is ever-changing, and the wildlife that call it home constantly change with the evolving landscape.

Making a Plan

A forest management plan will likely include prescriptions for each forest stand on a property. These prescriptions are rooted in silviculture, the science of why trees grow the way they do, and the art of manipulating the growing space of those trees to maximize the forest's long-term health. A management plan can also include recommendations that benefit forest songbirds and other wildlife. When landowners and foresters "see the forest for the birds," it becomes easier to work together and incorporate enhancing bird habitat into the management plan.

Implementing a Plan

Consulting foresters work with landowners and use their knowledge to help guide timber harvests. Loggers are also guided by the landowner's forest management plan through communication with the forester. This makes communication between the forester and landowner a critical component of the process to ensure landowner goals are met.

Technical Assistance and Funding

Contact your local Soil and Water Conservation District for technical assistance in assessing your forest habitats and to determine available financial assistance with the United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) or other programs available for controlling invasive plants and enhancing wildlife habitat by promoting the resources discussed in this section.

Over 40 Stewardship foresters from the Oregon Department of Forestry (ODF) provide free technical assistance to private forest landowners and small woodland owners across Western Oregon. Foresters can help provide information on financial incentives and technical assistance programs to help private forest landowners obtain their goals for responsibly managing their forest. See *Forest Resources* at oregon.gov/odf for more info.

Oregon State University (OSU), Forestry and Natural Resources Extension have online resources, programs, and extension agents across Western Oregon to help landowners learn about the latest techniques in natural resource management. OSU provides research-based knowledge and problem-solving educational programs designed to foster new ways to manage and use Oregon's forest resources wisely. More info at forestry.oregonstate.edu/forestry-and-natural-resources.

Managing Forest Stands with Birds in Mind

Focusing on specific habitat features one stand at a time allows landowners and land managers to apply a set of relatively simple, site-specific actions that will benefit birds and associated wildlife communities. Bird species differ in their use of habitat features and vegetation layers. Universal management for some important habitat features (such as snag and cavity density) may be possible on all managed stands, while others (such as high or low vegetative cover) may only be incorporated into certain silvicultural options. Remember the acronym C.H.R.P. when assessing your woods.

CHRP = Canopy, Health, Resources, and Protection

Canopy

Canopy refers to the tree species distribution and structural arrangement in your forest. Canopy features include: the number of age classes or levels/heights of vegetation; the amount of light available in the stand through gaps in the overstory; the tree species present in the overstory, midstory, and understory; and tree density. Canopy features can be similar throughout a forest, or vary from stand to stand.

Canopy gaps are used as foraging habitat by many bird species and allow light into the understory. More light leads to more regeneration and development of understory vegetation.

Practices for creating gaps in your forest:

- Consider implementing multi-aged management to create a mosaic of gaps and openings of different sizes across a forest. Try group selections up to 1 acre, or shelterwood harvests that open gaps around large trees to promote regeneration, or variable density thinnings.

- Alternatively, a *closed canopy* will exclude or limit understory vegetation. Depending on the maturity and species composition, a closed canopy may lead to connectivity favored by some species or provide for open-air mid-canopy gaps for a variety of flycatchers to use foraging.

Practices for maintaining a closed canopy in your forest:

- Limit the total area in gaps to no more than 20% of the stand during any 20-year period.

Associated Birds (Closed)
~ Hermit Warbler
~ Varied Thrush
~ Golden-crowned Kinglet
~ Acorn Woodpecker (oaks)

Associated Birds (Gaps)
~ Pacific Slope Flycatcher
~ Western Tanager (edge)
~ Chestnut-backed Chickadee
~ Vaux's Swift (larger gaps)

Tualatin Soil & Water Conservation District, 2019

Forest Health

A healthy forest is sustainable, resilient, sound in ecological function, and has the capacity to meet landowner objectives. In a changing climate, retaining these qualities for the forest as a whole requires healthy spacing to maintain tree vigor, structure variability, and species diversity to reduce stand vulnerability to disturbances. Monitoring for invasive plants, insects, and disease is equally important, for their presence can quickly destabilize forest health and habitat quality. Monitoring and management of these threats can be incorporated into a landowner's forest plan.

Practices to maintain a healthy forest:

- Include a variety of native tree and shrub species in your reforestation plans.
- Measure and track stand density throughout your forest. Consult with a forester to assess when to thin.
- Monitor for tree decline and mortality. Consult with a forester when there are multiple dead or dying trees of the same species.
- Learn to identify invasive plant and insect species. Consult a forester to assist with management options. Note: some native insects and diseases may kill individual trees while maintaining overall forest health and providing wildlife habitat.
- Pressure-wash mechanical equipment before arriving on-site to prevent introducing seeds and live roots from invasive plants.

Resources

Coarse woody material and forest floor complexity: Downed coarse and fine woody material promotes soil health and biodiversity, creates substrate and forage for insects, and secures cover for birds that feed and nest on the ground.

Leaf litter: In riparian, oak, and mixed forest types containing deciduous/hardwood trees, deep leaf litter (more than 1.5 inches thick) provides nesting habitat and foraging substrate for many insectivorous birds. Ecologically, litter functions much like downed woody debris and contributes to forest floor complexity.

Practices for enhancing forest floor complexity:

- When possible in a thinning operation, leave logs or trees that will become logs in a stand with needles and fine wood in the forest.
- If harvesting whole trees, retain on-site and scatter tops, limbs, and smaller trees from 33% or more of the harvest.

Associated Birds:
~ Pacific Wren
~ Spotted Towhee
~ Dark-eyed Junco
~ Varied Thrush
~ Hermit Thrush

Maria Thi Mai/Bureau of Land Management, 2014

Snags and cavity trees: Snags (dead standing trees) and live or decaying trees with cavities provide essential foraging and nesting habitat.

Practices for enhancing habitat with snags and cavity trees:

- Retain as many snags as possible. Ideally, aim for at least 6 snags or cavity trees per acre. Larger is better.
- In older stands with few snags or cavity trees, consider strategically managing to create snags with a minimum 20-inch dbh. Spaced girdling of some trees will allow adjacent trees to grow a wider canopy. Note: girdled trees may not stand as long as naturally decayed trees.
- Maintain a mix of snags and live trees with cavities or decaying trees scattered throughout the stand.
- Where snags are felled for safety reasons, leave in place to provide coarse woody material on the forest floor.
- Identify and retain some trees for future snags including larger trees with broken tops, large dead limbs, or other signs of potential decay.
- If using mechanical equipment, create snags by topping standing trees. For added benefit, leave topped woody material on the forest floor.

Associated Birds:
~ Pileated Woodpecker
~ Downy Woodpecker
~ Chestnut-backed Chickadee
~ Vaux's Swift
~ Brown Creeper
~ Slender-billed White-breasted Nuthatch
~ Acorn Woodpecker
~ Western Bluebird

Ponds, seasonal creeks, beaver dams, and other water features: Riparian habitat features provide support to the hydrological function of a stand and plant communities that capture nutrients, provide habitat, and support insect life. Often riparian areas have great plant and bird species diversity, but are also most vulnerable to invasive species like garlic mustard, English ivy, or knotweeds that can quickly change the understory and degrade habitat.

Practices for enhancing or maintaining riparian habitat:

- Learn your noxious riparian plants and monitor regularly for their presence. If present, call your local SWCD or stewardship forester for recommendations on effective and safe treatments.
- Leave or add fallen dead/dying trees to enhance structure and complexity.
- Avoid altering the topography along bank lowpoints to maintain access to floodplains or high runoff dispersal.
- Consider larger and meandering stream buffers instead of an even minimal distance to allow for habitat complexity.
- Plant for species diversity, and don't forget about those fruit or berry producing shrubs and trees, to build resilience and support bird species diversity.

Associated Birds:
~ Common Yellowthroat
~ Yellow Warbler
~ House Wren
~ Warbling Vireo
~ Marsh Wren
~ Kingfisher
~ Wood Duck
~ Bufflehead
~ Herons

Protection

Enhancing features of a forest that support the biological legacy of a stand and augment the resilience of the site benefits birds and landowners alike.

Practices for protecting essential forest features:

- Establish sufficient riparian buffer widths around rivers and waterways.
- Reduce harsh edge where possible (e.g., maintain continuous tracts of forest not dissected by roads or fields).
- Monitor and plan targeted use of herbicides in early successional sites.
- Mechanically thin stands to allow more light and understory development while reducing fire risk.
- Maintain healthy understory vegetation for shade and structure.
- Retain legacy trees to provide structural diversity.

Tualatin Soil & Water Conservation District, 2019

Managing Forests for Birds Across the Landscape

Think about forest block size, shape, and fragmentation from a bird's perspective. Understanding how a property fits into the bigger picture of the landscape with unfragmented contiguous forest and connection to other natural habitats is important to consider how birds inhabit resources at a regional level. This perspective can be useful when thinking about which aspects of a stand to emphasize or enhance. For example, a forest might connect two larger patches, or it might be a unique type of habitat offering the necessary variety to an otherwise homogenous landscape. The shape and size of a forest property also matters and may indicate the number of species or individuals of a focal species the property might support. From a landscape perspective, consider the different habitat types, topography, vertical and horizontal structure, soil moisture, age, and species diversity.

Support birds by creating insect factories. Songbirds need forests that support a rich supply of insect food resources. Insect food resources provide general sustenance, feed young, build protein reserves for molt and migration, and sometimes prepare for food-limited winter periods. The most pragmatic way to ensure adequate prey resources for birds is by maximizing the diversity of native vegetation within the site's constraints. Most insects are herbivorous, meaning various plants, including forbs and shrubs, can grow a forest full of birds through insect-mediated food chains. Some insect communities, like arthropods, are strongly associated with particular vegetation communities. Young forests and riparian habitats play significant roles in creating insect habitat due to their high productivity when herbaceous plants are abundant and diverse.

Time your harvest during flight season. A simple but ecologically vital way of minimizing the impact on breeding bird populations is to avoid harvesting during the peak of the breeding season. When averaged across all species, peak breeding season is the end of April to the end of July.

Habitat Fragmentation

The human-caused transformation of forests creates isolated patches of habitat, like islands in a sea of inhospitable habitat. In forests and riparian landscapes, nest predators have more access to breeding birds along the edges of habitat patches. This increased risk along habitat edges is why the shape of a patch and the connections between forest stands is crucial to breeding songbirds.

Nest predation: The land use of areas surrounding forest patches affects the threats presented by habitat edges. For instance, in a matrix of forested land and agricultural areas, forests are more susceptible to predators like house cats and cowbird parasitism. Brown-headed Cowbirds are nest parasites that lay their eggs in nests of other birds decreasing productivity of the host birds. On top of the challenges with incubating eggs, continued or frequent fragmentation also prevents young birds from returning to the breeding grounds the following year.

Barriers to Movement: Each bird species moves or disperses across a landscape differently. Conditions like habitat fragmentation becomes a barrier for many bird species to comfortably move across the terrain in search of suitable habitat or forage. A managed forest landscape comprised of forest stands with differing ages and species may support small but stable interconnected bird populations. However, much depends on the quality, size, and proximity to other forest patches. Thus, a network of friendly patches bridged by connective habitats is a desirable outcome of *Forestry for the Birds*.

Revaluing Historic Habitats

Some resources are rare in a landscape, which presents challenges for supporting connectivity as well as opportunities to develop new habitat. Modern oak habitats in the Northwest are disrupted by fire suppression, poor recruitment of new oaks, overgrazing, a market preference for faster-growing Douglas-fir, and the development of valley habitat for agriculture or residences. As a result, current oak habitats are fragmented, and most are on private land (98% in the Willamette Valley). Given the uniqueness of the habitat and cultural and historical significance in the region, oak ecosystems remain an essential part of the regional biodiversity and support a high degree of habitat specialization among oak-associated bird species. For example, oaks produce acorns, a vital food source with a long shelf life for birds such as Acorn Woodpeckers and Western Scrub Jays. Because acorn-eating birds often store or "cache" acorns, they are both seed predators and seed dispersers. While every acorn consumed is one less potential oak, the uneaten acorns have the opporunity to grow and expand the range of oak.

Similarly, a large percentage of riparian habitats in the region are privately owned. Unfortunately, over 70% of bottomland hardwood forests have been lost in the Willamette Valley, and the remaining riparian habitat has been impacted by human development, recreation, and agriculture. Some bird species specialize in early stage habitats with tall shrubs, dense understory, and herbaceous plant diversity. Healthy forests protect watersheds and water quality in rivers and urban settings.

Lastly, forests are seeing a decline in large-diameter snags and live trees with decaying branches. Both are essential for foraging and breeding for cavity-nesting birds. Snags and mature dying trees, sometimes require intentional retention in a managed forest. The bigger the snag, the better for wildlife. The most valuable snags house "primary excavators," the birds capable of digging cavities out of an intact snag or decaying tree. Therefore, birds like Hairy Woodpeckers and Red-breasted Sapsuckers play an essential role in making this rare resource available for many other species to use.

Managing for Birds and Fire

History of Fire in Western Oregon

Fire is a natural part of forest ecosystems. The frequency and severity of fires in a region vary with the combined conditions that create different forest communities, such as climate, soils, topography, and historical human influence. Historically, the wet Douglas-fir/western hemlock/western redcedar forests burned infrequently on a 100 to 450-year cycle with large, high-severity fires; whereas low-severity anthropogenic fires were historically more frequent in oak and pine dominated forests and savannas at lower elevations. A mix of high and low-intensity fires can serve important ecological functions in forests, such as removing fuels, creating understory gaps, and fostering early successional habitats with large remnant trees. They also reduce the severity and potential destruction of future fires.

Fire Suppression, Climate Change, & Megafires

As humans have become increasingly invested in protecting infrastructure and forest resources, fires have been largely suppressed over the past century. The suppression of smaller fires that once helped remove excess fuels in natural intervals has caused many forests to become unnaturally dense. These dense forests carry an excess of fuel for larger, more severe fires. When coupled with increasing summer temperatures and decreasing snowpack, the trend of fire suppression has led to the last 20 years of seasonal megafires in western forests.

Megafires occur in both arid and seasonally wet regions, and come at a tremendous cost to forest health, biodiversity, air quality, water quality, property, economies, and human life. It is a challenging time to live and work in forests, as it is to own and manage forests. Forest birds also likely experience these difficulties, as megafires destroy whole forests of food resources, snags, perches, and access to clean water.

Balancing Fire Preparedness & Bird Habitat

Many fire management strategies seemingly contradict recommendations for creating bird habitat in forests. For example, removing ladder fuels

Managing for Birds and Fire

may necessitate eliminating valuable understory and midstory nesting and foraging habitat. In reality, it is possible to manage for both habitat and fire. When preparing your forest for fire, it is important to focus fuel management where fires are most likely to start and spread (for example: roadsides, powerline corridors, around home or camp sites, steep slopes, etc.). In areas where a fire is less likely to start, retaining and maintaining habitat features like snags and downed logs has less impact on fire risk and severity. It is also reasonable to stagger or manage space between habitat features like understory trees and shrubs to disrupt the movement of fire through the forest.

In addition, birds will likely play a role in post-fire recovery! Seed dispersers like Acorn Woodpeckers, bluebirds, thrushes, and Band-tailed Pigeons can aid in the regeneration of shrubs (which will stabilize exposed soils) as well as overstory species.

Fire Strategies

Forest managers consider a variety of strategies to prepare forests for extreme fire conditions, primarily managing forest fuels. Strategies include:

- Removing ladder fuels such as lower tree limbs and small trees adjacent to larger trees. These fuels allow ground fires to progress into crown fires under certain conditions.
- Selective thinning from below, which means removing smaller trees or co-dominant trees to reduce the fuel load in a forest stand.
- Managing the spacing and density of large coarse woody debris, such as downed logs or snags, to minimize the spread of a ground fire.
- Building and maintaining strategic fire breaks and roads to slow fire spread and provide emergency vehicles access.

It's essential to take a holistic view of each stand and the surrounding landscape to assess fire risk under the expectations of more recent trends. In addition, management decisions should focus on making forests more resilient to fire by increasing or maintaining forest health.

What Will My Future Forest Look Like?

Visualizing the growth and changes of a forest over time...

Forests change as they grow and can take a long time to mature. Additionally, different forest types have different appearances or attributes associated with stand age. Every forest stand has unique characteristics and thinking about some of the generalities of stand maturation may make identifying bird habitat easier.

Oversight of a forest may begin at any given growth stage. Management goals will vary between landowners, but there are opportunities at each stage to develop habitat. One objective could be to enhance younger forests to function more like an older forest, thus attracting birds that you would see in older forests. Much depends on the type and extent of management and the connection of the managed forest to other adjacent habitat features (water, older forest, riparian/hardwood stands, or even young/open habitat) and patch size. It is worth noting that if you don't find these birds in your 35-year-old even-aged stand, don't be discouraged. Assessing forest features and recognizing opportunities to enhance or maintain existing habitat is what we mean by managing a forest with birds in mind.

Within the following storyline, any of the stages, conditions or parts thereof can be the starting point for management considerations and don't necessarily begin with a harvest. The age of each storyline's stage may not directly apply and varies across Western Oregon ecoregions. This section is to provide a narrative or thought process for landowners or managers as they cruise stands. The primary goal is to observe conditions, shrub and herbaceous species, signs of wildlife and birds, forest floor and canopy features, and everything else in between to guide desired outcomes and conditions for a healthy forest and desirable habitat for birds.

Regeneration - The First 10 Years

Seedlings can grow into a young stand quickly...

The Stand: Downed woody materials have not yet decomposed. Some remnant living trees and ideally a few large snags remain in among the short (1-10 feet tall) seedlings, saplings, and small deciduous species (bigleaf maple, red alder). Woody shrubs emerge above the grasses and non-woody herbaceous plants. In spring, patches of bracken fern flourish, but this is also the period your stand is most susceptible to weedy invasive species such as Scotch broom and Himalayan blackberry.

Regeneration following a clearcut harvest, OSU Extension, 2016

How do birds use the habitat?

- Insectivorous birds like swifts, swallows and Olive-sided Flycatchers use forest clearings to catch flying insects in spring and summer, using large snags for nesting and perching.
- MacGillivray's Warbler and Orange-crowned Warbler are woody-shrub-dependent and Spotted Towhee and White-crowned Sparrow are scrub-loving species that also occupy the site.
- Exposed snags provide nesting habitat for Northern Flickers and Vaux's Swifts, and if the area is among large swaths of other unconverted stands Pileated Woodpeckers will also stay and breed in this habitat.
- If mature stands are near, species like Pacific Wren or Hammond's Flycatcher forage in open spaces between the bottom of the canopy and the ground in search for insects before returning to their perches.
- If adjacent to water features or riparian woodlands, the young stand attracts Lazuli Bunting, Yellow-breasted Chat, Wilson's Warbler, and Song Sparrow that have an affinity for overlapping shrub and open canopy habitat.
- In fall and winter, fewer birds are there, but Dark-eyed Juncos, American Goldfinch, and Pacific Wren may still be present as year-round residents.

Management considerations: This is an important stage in a stand's life, critical to many birds, and landowners can play a valuable role in supporting healthy habitat and setting up the forest's future. If harvesting, consider the regeneration stage and retain legacy trees and snags to provide nesting and foraging sites for various species. If you haven't replanted yet, reduce or vary density of seedlings at planting to postpone crown closure. Limit herbicide use or target specific species observed without conceding the site to blackberries, brooms, and ivy, while also meeting reforestation requirements. This can reduce negative impacts on tree seedlings and foster plant diversity. If a stand was already planted, thin young stands as early as possible, again, to delay canopy closure and maintain some understory as it moves into its next stage.

Natural regeneration post fire in southwest Oregon, Klaus Puettmann, 2009

A Young Forest - 20 to 40 Years Old

The site is occupied by small saw timber trees...

The Stand: The trees are now 40 to 60 feet tall, or at least 14 inches in diameter, and stem exclusion is occurring if not thinned between 10 and 20 years. Generally, the trees are close together and dominated by a single cohort (even-aged). Large remnant trees and snags remain as legacies of the prior stand. Less sunlight reaches the forest floor, and there is a mix of conifer and deciduous trees. If the stand was managed to foster mature forest habitat in its first 30 years this stand might function more like an older stand, with species seen typically in 60 to 80 year old stands.

How do birds use the habitat?

- The site no longer meets the habitat needs for many of the species that occupied the stand during its regeneration stage. However, species reliant on woody debris like Dark-eyed Junco, Spotted Towhee, and Bewick's Wren continue to use this area nesting in shrubs and grasses particularly along roadcuts or powerlines.
- Black-throated Gray Warblers now forage throughout the canopy, particularly in the deciduous trees.
- Light along the edge of this stand also makes this habitat type more attractive to Swainson's Thrush or Orange-crowned Warbler.
- Where snags are present, Hairy Woodpeckers and Red-breasted Sapsuckers play a primary role as excavators in this forest.
- Leaf-gleaning flocks of kinglets and chickadees pass through this stand to forage.

Management considerations: The typical age for the first commercial thinning of an even-aged stand is around 35 years and a harvest between age 35 to 55. Choosing to thin at this stand age can create canopy gaps, allow more sunlight to reach the forest floor, and encourage the initiation of understory vegetation. As a result, woody shrubs and ferns will develop in the understory promoting a natural layering of vegetation. Allowing more sunlight to the understory benefits forest function and individual tree growth in most even-aged stands. Commercial thinning and the understory condition following the thinning will be improved by timely pre-commercial thinning (PCT) 10 to 20 years prior.

A partial harvest with overstory retention, Peter Hayes, 2006

A Mature Forest - 60 to 80 Years Old

The forest is re-initiating its understory and a multi-layered canopy is developing...

The Stand: Though the trees have reached maturity, they will have characteristics of younger forests. Conifer trees are overtopping most of the deciduous trees. There are patches of closed canopy intermixed with open canopy or canopy gaps allowing an understory of shrubs and forbs with snags and tree falls creating small gaps.

How do birds use the habitat?

- In the closed conifer canopy, there are singing Hermit Warblers and Chestnut-backed Chickadees.
- Golden-crowned Kinglets and Brown Creepers, and other birds that use old forests, occupy the site.
- Hairy Woodpeckers and Pileated Woodpeckers excavate cavities in snags.
- Swainson's Thrush sing and nest in the dense tangles of deciduous and conifer understory.
- In open air spaces beneath a closed canopy, flycatchers like Pacific Slope Flycatcher are common.

Management considerations: Take careful inventory of this stand from the basal area to the understory species. This is the time landowners can start managing for a new legacy of select old growth trees. Some landowners selectively mark even-aged stands in this age class then commercially thin the trees. In this case, the usual management practice is to select and harvest co-dominate or poor-quality trees. However, some poor-quality trees provide useful resources for birds at the time of harvest or in the future as they grow.

Generally, forest landowners with smaller forest tracts do not have maximizing growth, yield, and investment returns as a top forest management goal. Many can implement uneven-aged management strategies that may offer opportunities to focus on improving bird habitat for multiple species.

Peter Hayes, 2011

Growing Old - 150 Years and Counting

Creating and Retaining Legacy Forests...

The stand: A growing rarity in Western Oregon, the width of the trees will be your strongest indicator. The forest floor will be a mix of duff and moss and shade tolerant understory species, and the mostly closed canopy will be up high along with the large bare branches obscuring the canopy top.

How do birds use this habitat? You'll see similar species here as those mentioned in the 60 to 80 year old stand, but you may notice them more in a vertical assemblage from the upper canopy and low understory. The canopy is now a complex community of its own both in structure and food resource provision.

Management considerations: Many landowners have older conifers and hardwoods that exhibit old-growth forest characteristics: large diameters, huge limbs, thick bark, and various stages of decay and decline. Usually, these trees have little commercial value and, in some cases, are difficult to remove. However, they provide many benefits to birds and other wildlife, and other forest functions like carbon storage, a growing and potential market.

Conclusion

Forestry for the Birds is about making the most of an opportunity. Any forest managed with intent to make that forest work better for birds and people is a victory for all. This forest stewardship program, tailored to the needs of each individual user, can support plants and animals, watersheds, sustainable harvests, and fire resilient communities while advancing the health of forests and bird populations alike. Birds bring management objectives into focus, help us see the big picture, and will continue to sing in working forests for generations to come with your thoughtful stewardship.

Tualatin Soil & Water Conservation District, 2019

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